

DRAFT
**2017 DATA SUMMARY REPORT FOR VOLATILE ORGANIC
COMPOUNDS AND 1,4-DIOXANE**

SITE 00002-FORMER FIRE TRAINING AREA

**Naval Weapons Industrial Reserve Plant (NWIRP) Calverton
Calverton, New York**

**COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT**

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Acronyms and Abbreviations

AFFF	aqueous film forming foam
bgs	below ground surface
CLEAN	Comprehensive Long-Term Environmental Action Navy
DCA	1,1-dichloroethane
DCE	1,1-dichloroethene
LUC	Land use control
MCL	Maximum Contaminant Level
MEC	Munitions and explosives of concern
NAVFAC	Naval Facilities Engineering Command
NWIRP	Naval Weapons Industrial Reserve Plant
NYSDOH	New York State Department of Health
PAH	Polycyclic aromatic hydrocarbon
PCB	Polychlorinated biphenyl
PCE	Tetrachloroethene
PFAS	Per- and polyfluoroalkyl substances
pH	Potential of hydrogen
SVOC	Semi-volatile organic compound
TCA	1,1,1-trichloroethane
TCE	Trichloroethene
U.S. EPA	United States Environmental Protection Agency
VOC	volatile organic compound

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Executive Summary

The Naval Weapons Industrial Reserve Plant (NWIRP) Calverton facility is located in Suffolk County on Long Island, New York, approximately 70 miles east of New York City. Formerly engaged in the manufacture of aircraft parts and assemblies, the facility was a government-owned, contractor-operated installation until 1996. Site 2 – Former Fire Training Area is located within a 10.5-acre clearing in the south-central portion of the facility.

Site 2 was used by Northrop Grumman and Navy crash rescue crews as a fire training area since 1955, and possibly as early as 1952. Activities at the Former Fire Training Area had consisted of clearing an area up to 100 feet or more in diameter and enclosing it with an earthen berm. A layer of water was then placed within the bermed area. Waste fuels, oils, and waste solvents (including heating fuels that contained polychlorinated biphenyls [PCBs]) were floated on the water, ignited, and then extinguished. These substances are possible sources of chlorinated and non-chlorinated hydrocarbon contaminants, including polycyclic aromatic hydrocarbons, in the environment.

The extent of VOCs in groundwater has been delineated through the remedial investigation process. However, a remedy for VOCs in groundwater is not being pursued at this time while emerging contaminants (1,4-dioxane and per- and polyfluoroalkyl substances [PFAS]) are investigated at Site 2. This supplemental investigation evaluating concentrations of 1,4-dioxane at Site 2 was conducted because 1,4-dioxane is associated with the chlorinated VOCs. The attenuation and migration of VOCs is also being evaluated under this investigation. PFAS are being evaluated under a separate investigation.

Groundwater flow at Site 2 is to the south east. In 2017, VOCs in groundwater were generally detected at concentrations less than New York State Department of Health (NYSDOH) Maximum Contaminant Levels (MCLs). However, the following groundwater water monitoring wells and piezometers had VOC concentrations greater than the NYSDOH MCL:

- FT-MW09I - 1,1-Dichloroethane (DCA) was detected at 11.5 J micrograms per liter ($\mu\text{g/L}$),
- FT-PZ460I – Trichloroethene (TCE) was detected at 100 $\mu\text{g/L}$, 1,1-DCA at 23.2 $\mu\text{g/L}$, and 1,1-dichloroethene (DCE) at 60.4 $\mu\text{g/L}$, and
- FT-PZ461I - TCE was detected at 20.5 $\mu\text{g/L}$.

FT-PZ460I and FT-PZ461I are located in an area with known as an anomaly. The presence of these VOCs does not appear to be directly related to the facility activities.

1,4-Dioxane was detected in 5 of 31 sampled wells at concentrations ranging from 0.11J µg/L to 3.70 µg/L. Concentrations of 1,4-dioxane did not exceed the NYSDOH MCL of 50 µg /L.

Trend analysis shows that concentrations of VOCs are generally decreasing over time, except for concentrations of 1,1-DCA and 1,1-DCE at FT-PZ460I where 1,1-DCA concentrations increased from 14 µg/L in 2012 to a maximum detection of 43 J µg/L in 2013 and then decreased to 23 µg/L in 2017. Similarly, 1,1-DCE concentrations increased from 21 µg/L in 2012 to a maximum detection of 130 µg/L in 2014 and then decreased to 60 µg/L in 2017. The increase of 1,1-DCA and 1,1-DCE at FT-PZ460I in 2012 and 2014 suggest that TCE is degrading at FT-PZ460I.

The recommended path forward is to conduct a supplemental investigation for VOCs and 1,4-dioxane to support the next 5-Year Review.

1.0 INTRODUCTION

This Data Summary Report was prepared by Tetra Tech under the Naval Facilities Engineering Command (NAVFAC) Atlantic Comprehensive Long-Term Environmental Action Navy (CLEAN) Contract Number N6247016D9008, Task Order WE05 to present the results for the 2017 sampling event at Site 2 – Former Fire Training Area at Naval Weapons Industrial Reserve Plant (NWIRP) Calverton, New York (Figure 1-1). This investigation consisted of the collection of water levels and the sampling and analysis of volatile organic compounds (VOCs) and 1,4-dioxane in groundwater.

1.1 Objective

The objectives of the monitoring program at Site 2 are:

- Evaluate groundwater flow direction.
- Evaluate attenuation and migration of VOCs.
- Evaluate the presence of 1,4-dioxane on and off property and whether this contaminant is associated with the VOC plume in groundwater.

1.2 Report Organization

The Monitoring Report is organized as follows:

- Section 1 introduces the report and presents the objectives.
- Section 2 describes the site location, history, and the conceptual site model.
- Section 3 describes the activities conducted during the 2017 field investigation.
- Section 4 evaluates the current sampling data and groundwater plume trends.
- Section 5 summarizes conclusions and provides recommendations for future activities.

2.0 SITE DESCRIPTION

The Navy's Calverton facility is located in Suffolk County on Long Island, approximately 70 miles east of New York City. Formerly engaged in the manufacture of aircraft parts and assemblies, the property known as NWIRP Calverton, New York was a government-owned, contractor-operated installation until 1996. Since that time, all the property contained within the perimeter fence have been conveyed to the Town of Riverhead, except for three noncontiguous parcels of land (Site 2, Site 7, and Site 6A/Site 10B/Southern Area), identified on Figure 1-1, totaling approximately 209 acres that are being retained by the Navy to continue Installation Restoration Program activities. Site 2 – Former Fire Training Area is the subject of this report.

2.1 Location and History

Site 2 – Former Fire Training Area is located within a 10.5-acre clearing in the south-central portion of the facility (Figure 2-1). Overall, the clearing slopes uniformly to the southeast (2 to 3 percent). The area is lightly vegetated with some minor erosion noted in portions of the site with steeper slopes. Mature woodlands surround the site. Access to the site is from Grumman Boulevard to the south via a gravel road and a locked gate.

Site 2 was used by Northrop Grumman and Navy crash rescue crews as a fire training area since 1955, and possibly as early as 1952. Activities at the Former Fire Training Area had consisted of clearing an area up to 100 feet or more in diameter and enclosing it with an earthen berm. A layer of water was then placed within the bermed area. Waste fuels, oils, and waste solvents (including heating fuels that contained polychlorinated biphenyls [PCBs]) were floated on the water, ignited, and then extinguished. These substances are possible sources of chlorinated and non-chlorinated hydrocarbon contaminants, including polycyclic aromatic hydrocarbons (PAHs), in the environment. Aqueous film forming foam (AFFF), Halon 1301 (a gas), and dry chemical extinguishers were used to extinguish the flames (NEESA, 1986). In 1982 and 1983, two spills of waste oil were reported at the Former Fire Training Area. As a result of these two spills, the entire area was upgraded with a concrete fire training ring with spill protection designed to reduce the potential for release of organic solvents and fuels to the environment. In 1996, fire training activities at the site ceased.

2.2 Previous Investigations and Remedial Actions

A trichloroethene (TCE) groundwater plume (western plume) and a TCE and xylene groundwater plume (eastern plume) have been identified on property at Site 2 through remedial investigations conducted from 1995 to 2016. These TCE plumes are evidence that VOCs have been released to the environment as a result of fire training activities.

The western TCE plume starts at FT-MW03S and continues at least 6,000 feet to the southeast to near Donahue Pond (Figure 2-1) (Tetra Tech, 2016).

Historical testing for 1,4-dioxane has been limited. In 2015, the Navy collected groundwater samples from two on-property monitoring wells (FT-MW09I and FT-MW10I) and analyzed the samples for 1,4-dioxane using United States Environmental Protection Agency (U.S. EPA) method SW-846 8270D selected ion monitoring. This method results in detection limits of approximately 0.042 µg/L versus approximately 10 µg/L using U.S. EPA Method SW-846 8260B to analyze samples for VOCs. During the 2015 sampling event, 1,4-dioxane was not detected in the two on-property wells (Figure 2-1). In 2016, the Suffolk County Department of Health Services collected samples from six wells within the Site 2 monitoring well network. Samples were analyzed for 1,4-dioxane using U.S. EPA Method 522, which is the method for drinking water. Off-property, concentrations of 1,4-dioxane ranged from non-detect at two wells (FT-PZ454S and FT-PZ456S) to a maximum of 15 µg/L (FTPZ460I).

To date, remedial activities at Site 2 have consisted of spill cleanup of waste oil, removal of storage tanks and contaminated soil, installation and operation of a free product recovery system, installation and operation of an interim pilot-scale air sparging/soil vapor extraction system, and excavation and offsite disposal of remaining site structures and shallow (less than 6 feet) petroleum product- and PCB-contaminated soils. Locations of these interim remedial actions are presented on Figure 2-2. Also, buried drums, encountered during the remedial activities, have been removed and disposed offsite. Deep residual petroleum product (xylene) contaminated soil remains at the site. Clean fill was used to fill the excavations so surface soil is no longer contaminated.

In February 2010, during a soil sampling event to support a planned future soil excavation, an item considered a potential munition and explosives of concern (MEC) was encountered at the PAH Removal Area (Figure 2-2) and removed from the site. From 2012 to 2015, MEC clearance activities were conducted at Site 2 to remove MEC items.

2.3 Proposed VOC Remedy

The extent of VOCs in groundwater has been delineated through the remedial investigation process. A Feasibility Study was developed to identify and evaluate remedial action alternatives for VOCs in groundwater, including natural attenuation of contaminant concentrations (Tetra Tech, 2016). The 2017 Proposed Plan identified the preferred alternative that consisted of Land Use Controls (LUCs), groundwater monitoring, and treatment of additional source areas, such as underlying soils where there is evidence of a continuing or new release of petroleum or chlorinated solvents.

Comments and concerns about emerging contaminants that may be present at Site 2 were received during the public comment period. In response to these comments, a remedy for VOCs in groundwater is not being pursued at this time while the emerging contaminants (1,4-dioxane and PFAS) are being investigated at Site 2. This supplemental investigation was conducted because 1,4-dioxane is associated with the chlorinated VOCs. The attenuation and migration of VOCs is also being evaluated under this investigation. PFAS are being evaluated under a separate investigation.

2.4 Conceptual Site Model

A conceptual site model facilitates consistent and comprehensive evaluation of potential risks to human health by creating a framework for identifying the pathways by which human receptors may come in contact with environmental media contaminated by site activities. Figure 2-3 illustrates the conceptual site model for Site 2.

2.4.1 Site Geology and Hydrogeology

NWIRP Calverton lies within the Atlantic Coastal Plain Physiographic Province. Generally, this region can be characterized as an area of relatively undissected low-lying plains. The Atlantic Coastal Plain is underlain by a thick sequence of unconsolidated deposits. The surface topography has been created or modified by Pleistocene glaciations (Isbister, 1966). The facility is underlain by approximately 1,300 feet of unconsolidated sediments that consist of four distinct geologic units. These units, in order of descending elevation, are the Upper Glacial Formation, the Magothy Formation, the Raritan Clay Member of the Raritan Formation, and the Lloyd Sand Member of the Raritan Formation (McClymonds and Franke, 1972).

Site 2 is underlain by three distinct lithofacies. The upper lithofacies ranges from 1 to 7 feet thick and consists of predominantly dark brown, brown, and orange, silty, fine-grained sand, with varying amounts of peat and clay. Soil-type fill encountered at the site is associated with the upper lithofacies. The middle lithofacies ranges from 54 to 78 feet thick and consists of light brown and tan fine-grained sand with varying amounts of medium-grained sand and pebbles. The middle lithofacies probably represents undisturbed glacial deposits. The lower lithofacies consists of gray, silty clay. A continuous clay layer underlies Site 2 at a depth of approximately 80 to 100 feet below ground surface (bgs). The subsurface geology of Site 2 is consistent with that found in other areas of the facility.

Groundwater in the glacial deposits occurs under unconfined conditions. Groundwater flow at Site 2 is toward the southeast, with elevations ranging from 30 to 38 feet above mean sea level. The Peconic River basin is the ultimate discharge point for

groundwater in the shallow aquifer zones in the southern portion of the NWIRP Calverton.

The north eastward-flowing Peconic River is located approximately 6,800 feet to the southeast. Groundwater in this area is classified as a sole-source aquifer (class GA), for use as a potable water supply. The Peconic River discharges to Peconic Bay, located 8.5 stream miles from the facility (not shown on figures).

2.4.2 Contaminant Sources

Potential contaminant sources include fuel, waste solvents, PCB-contaminated waste oils burned during fire training activities and AFFF used to extinguish fires during fire training activities. Based on known site activities, chemicals expected to be possible environmental contaminants associated with Site 2 are chlorinated hydrocarbons, including PCBs; and non-chlorinated hydrocarbons, including PAHs. The only identified contaminants of concern for this investigation are VOCs, which could have been released directly to surface soil. The areal extent of soil contamination is conservatively estimated to be 90 feet by 125 feet within the cleared area inside the property boundary (Figure 2-2). Soil contamination is present in subsurface soil at a depth of 12 to 20 feet bgs. This residual soil contamination is associated with the former free product area and appears to have formed during previous fluctuations in the water table (shallow groundwater across Site 2 ranges from 10 to 20 feet bgs). The residual soil contamination from petroleum product includes both saturated and unsaturated (capillary zone) soils. Otherwise, all known source areas at Site 2 have been removed.

2.4.3 Contaminant Migration Pathways

Two VOC plumes in groundwater were identified on Site 2. A smaller TCE plume, isolated within the property boundary, is situated in the eastern portion of the site. The primary area of contamination consists of a VOC plume originating in the western portion of the Site 2 clearing and extends off property. On property, the western TCE plume is approximately 10 feet thick and 350 feet wide at its widest point, and extends southeast at least to the NWIRP fence line (property line) (Tetra Tech, 2016). Based on an ongoing off-property groundwater investigation, the groundwater plume continues approximately 6,000 feet to the southeast to near Donahue Pond (Figure 2-1). Off-property, the plume located is approximately 30 feet bgs.

From the contaminated soil area, VOCs leached and dissolved into groundwater. Both the VOC plumes extend to the southeast; however, the western plume extends off property following general groundwater flow. 1,4-Dioxane may have been introduced into the groundwater with the VOCs.

2.4.4 Potential Receptors

Human Receptors

Currently, Site 2 is not used for any activities. Access to the site is restricted by a fence and there are no structures on the site to attract trespassers or routine visitors. After the investigation/remediation activities are completed, Site 2 will be transferred to the Town of Riverhead for environmental conservation and recreational use. Anticipated future use of the site is for nonresidential activities; however, residential use remains a remote possibility. Off property, the majority of the land is owned by the County of Suffolk and a private club. Current off-site land use is for recreational activities (golfing, hunting, fishing, and hiking). Based on potential future land use, the following receptors may be exposed to contaminated environmental media within the study area: construction workers, industrial workers, and recreational users (child and adult).

The primary medium through which human receptors can be exposed to VOCs and 1,4-dioxane is through dermal contact and ingestion of groundwater. Groundwater at the site is classified as a future source of potable water and the aquifer is classified as a sole source drinking water aquifer. Because there are no structures present at Site 2, there is an incomplete exposure pathway for vapor intrusion and inhalation.

Ecological Receptors

The Navy conducted an evaluation of ecological receptors and concluded that Site 2 Parcel lies in an area of disturbed soil and ruderal (weedy) terrestrial vegetation that lacks sensitive ecological receptors capable of being significantly affected in an adverse manner by environmental contamination (Tetra Tech, 2001). The woodlands surrounding the Site 2 Source Area are classified as Pine Barrens. Wetlands and surface water are not present at the site, but are located hydraulically downgradient of the site. Habitat for tiger salamanders, a state-endangered species, has also been identified within the off-site wetlands and surface water, which are not currently affected by Site 2 contamination.

3.0 FIELD INVESTIGATION

Past activities at Site 2 have contaminated groundwater with VOCs at concentrations greater than New York State Department of Health (NYSDOH) Maximum Contaminant Levels (MCLs). The following subsections discuss the supplemental investigation conducted in 2017 to evaluate the attenuation and migration of VOCs and the presence of 1,4-dioxane.

3.1 Field and Sampling Activities

Field activities were conducted between November 14 and December 15, 2017. The activities for the 2017 sampling event consisted of:

- Collection of water levels from 34 monitoring wells.
- Collection of groundwater samples from 11 monitoring wells and VOC analysis.
- Collection of groundwater samples from 31 monitoring wells and 1,4-dioxane analysis.

Water levels were measured at 34 monitoring well locations on November 14, 2017. The monitoring well network is presented on Figure 4-1. This data was used to generate a groundwater potentiometric contour map and provide information on groundwater flow and patterns. Water level measurements were recorded to the nearest 0.01 foot and referenced to a top of casing notch or north side of the well casing. The measurement instrument was decontaminated prior to conducting the water level measurement and between each monitoring well.

Groundwater sampling was conducted via low-flow sampling procedures. The sampling locations are presented on Figure 4-1. A peristaltic pump with high-density polyethylene tubing was used for groundwater sample purging and collection activities, in combination with a continuous flow-through cell suitable for taking water quality measurements. Field parameters including turbidity, dissolved oxygen, potential of hydrogen (pH), specific conductance, and temperature were recorded during low-flow purging and sampling activities. A sample log sheet was completed for each well (Appendix A). Samples were collected after water levels and field parameters stabilized. Stabilization of parameters is defined as three consecutive readings, taken at 5 to 10-minute intervals, within the following limits:

- pH ± 0.2 standard units
- Specific conductance ± 10 percent
- Temperature ± 10 percent
- Turbidity less than 10 nephelometric turbidity units

- Dissolved oxygen ± 10 percent

If the above conditions were not satisfied after five screen volumes had been purged or a well had been purged for one hour, purging was considered complete and samples were collected. Sample log sheets for sampling at each location are provided in Appendix A.

4.0 DATA EVALUATION

The results of the November and December 2017 sampling event are presented in this section. Trend analysis was conducted on current and historical data (data collected since 2012) for select monitoring wells.

4.1 Water Level Measurements and Groundwater Flow Direction

Water levels were measured in 34 monitoring wells on November 14, 2017. Results of the round of synoptic water level measurements are presented in Table 4-1 and on Figure 4-1. Groundwater flow at Site 2 is toward the southeast, with elevations ranging from 30 to 38 feet above mean sea level.

4.2 2017 Sample Results

Results for the November and December 2017 groundwater sampling event are summarized on Tables 4-2 and 4-3 for on and off property locations, respectively. The data validation letters and laboratory results for the November and December 2017 sampling event are provided in Appendix B. The 2017 results as well as historical data (2012 through 2016) are presented on Figures 4-2 and 4-3. The historical data summary tables are provided in Appendix C.

4.2.1 VOCs

Groundwater samples collected from 11 monitoring wells were analyzed for VOCs during the November and December 2017 sampling event. VOCs were detected in 8 of 11 groundwater samples. On-property VOCs detected include 1,1,1-trichloroethane (TCA), 2-butanone, acetone, ethylbenzene, xylenes, tetrachloroethene (PCE), toluene, TCE, vinyl chloride and 1,1-dichloroethane (DCA). Off-property VOCs detected include 1,1-DCA, 1,1- dichloroethene (DCE), cis-1,2-DCE, PCE, and TCE. Results were compared to NYSDOH MCLs. NYSDOH MCLs were exceeded in groundwater samples at the following three monitoring well locations:

- FT-MW09I - 1,1-DCA was detected at 11.9 µg/L and 11.5 µg/L in the duplicate sample.
- FT-PZ460I - TCE was detected at 100 µg/L, 1,1-DCA at 23.2 µg/L, and 1,1-DCE at 60.4 µg/L.
- FT-PZ461I - TCE was detected at 20.5 µg/L and 20.6 µg/L in the duplicate sample.

4.2.2 1,4-Dioxane

Groundwater samples from 31 wells were analyzed for 1,4-dioxane during the November and December 2017 sampling event. The NYSDOH MCL for 1,4-dioxane defaults to the MCL for unspecified contaminants of 50 µg/L (NYSDOH, 2018). The U.S. EPA regional screening level (RSL) for tapwater is 0.46 µg/L (U.S. EPA, 2018).

1,4-Dioxane was detected in 5 of 31 sampled wells at concentrations ranging from 0.11 µg/L to 3.70 µg/L. Concentrations of 1,4-dioxane did not exceed the NYSDOH MCL of 50 µg/L. The U.S. EPA RSL of 0.46 µg/L was exceeded in groundwater samples collected at two monitoring well locations.

- FT-PZ460I - 1,4-dioxane was detected at 3.70 µg/L.
- FT-PZ461I - 1,4-dioxane was detected at 1.00 µg/L.

The U.S. EPA RSL for tap water is based on a cancer risk of 1×10^{-6} (i.e., a one-in-1,000,000 probability of developing cancer). The U.S. EPA target cancer risk range is 1×10^{-6} to 1×10^{-4} . The groundwater concentrations of 1,4-dioxane do not exceed an adjusted RSL (46 µg/L) based on a cancer risk of 1×10^{-4} . The groundwater concentrations of 1,4-dioxane are also less than the tap water RSL based on non-cancer risk of 57 µg/L.

4.3 2012 to 2017 VOC Trend Analysis

Historically, contamination at Site 2 has consisted of chlorinated solvents (primarily TCE) and fuel-related compounds (primarily xylenes). Other site related VOCs such as TCA and PCE as well as degradation products such as 1,1-DCA and 1,1-DCE have been observed in monitoring wells since 2012. Data from 2012 to 2017 for Site 2 monitoring wells are presented in Appendix C. Trends for select VOCs were evaluated for the following on-property monitoring wells from 2012 to 2017: FT-MW02S, FT-MW03S, FT-MW09I, and FT-MW10I. Trends were also evaluated for the following off-property monitoring wells: FT-PZ458I, FT-PZ460I, and FT-PZ461I.

4.3.1 On-Property Evaluation

FT-MW02S is located downgradient of the former fire training ring, where the Site 2 eastern plume (TCE and xylene) originated. TCE, xylene, and ethylbenzene concentrations detected in groundwater at FT-MW02S are presented on Figure 4-4. From 2012 to 2015, TCE and xylene concentrations have been less than the NYSDOH MCL or not detected. In 2015, ethylbenzene was detected at 5.2 µg/L exceeding the NYSDOH MCL of 5 µg/L but concentrations decreased to less than the MCL during the 2016 and 2017 sampling events.

FT-MW03S is located at the western portion of the Site 2 clearing, where the Site 2 western TCE plume originated. FT-MW09I is located downgradient of FT-MW03S. TCE, TCA, and 1,1-DCA concentrations detected in groundwater at FT-MW03S and FT-MW09I are presented on Figure 4-5 and Figure 4-6. At FT-MW03S, TCE concentrations have been less than the NYSDOH MCL since 2012. Whereas at FT-MW09I, TCE concentrations have decreased to less than the NYSDOH MCL during the 2016 and 2017 sampling events. At FT-MW03S, concentrations of TCA (25 µg/L) and 1,1-DCA (37 µg/L) increased from not detected in 2013 to greater than the NYSDOH MCL of 5 µg/L in 2014. A similar increase was observed at FT-MW09I in 2015 with TCA (34 µg/L) and 1,1-DCA (120 µg/L) increasing to concentrations greater than the NYSDOH MCL. This increase has been attributed to a chemical mobilization associated with the removal of multiple drums encountered during a removal action for MEC in 2014. By 2017, concentrations of TCA and 1,1-DCA at FT-MW03S and TCA at FT-MW09I decreased to less than the NYSDOH MCL. 1,1-DCA (12 µg/L) continues to exceed the NYSDOH MCL in 2017.

FT-MW10I is located at the Site 2 property boundary within the western TCE plume, downgradient of FT-MW03S and FT-MW09I. TCE, TCA, and 1,1-DCA concentrations detected in groundwater at FT-MW10I are presented on Figure 4-7. At FT-MW10I, the TCE concentration (6.6 µg/L) slightly exceeded the NYSDOH MCL in 2013 but has since decreased to less than the NYSDOH MCL. Although FT-MW10I is located downgradient of FT-MW09I, TCA and 1,1-DCA continue to not be detected, which suggests that the VOCs mobilized from the 2014 removal of drums have attenuated or have not yet migrated to this well location.

4.3.2 Off-Property Evaluation

FT-PZ458I is located south east of Swan Pond, within the previously delineated western TCE plume that extends from Site 2. TCE, 1-DCA, and 1,1-DCE concentrations detected in groundwater at FT-PZ458I are presented on Figure 5-8. At FT-PZ458I, TCE concentrations decreased from 25 µg/L in 2012 to 15 µg/L in 2015 to an estimated concentration of 4.1 µg/L in 2017, which is less than the NYSDOH MCL of 5 µg/L. Concentrations of 1,1-DCA and 1,1-DCE are less than the NYSDOH MCL.

FT-PZ460I and FT-PZ461I is located downgradient of Site 2 and is the location of a TCE anomaly, where elevated levels of VOCs (primarily TCE, DCE, and DCA) have been observed. The 2013 investigation did not identify a specific source for this anomaly, but did conclude that there was no apparent source or continuing source of high-concentration VOCs linked to Site 2 based on groundwater flow and a lack of significant TCE detections in temporary wells west (hydraulically upgradient) of FT-PZ460I. TCE, 1,1-DCA, and 1,1-DCE concentrations at FT-PZ460I and FT-PZ461I are

presented on Figure 5-9 and Figure 5-10. TCE concentrations decreased between 2012 and 2017 from 600 µg/L to 100 µg/L at FT-PZ460I and from 74 µg/L to 20.6 µg/L at FT-PZ461I.

At FT-PZ460I, 1,1-DCA concentrations increased from 14 µg/L in 2012 to a maximum detection of 43 J µg/L in 2013 and then decreased to 23 µg/L in 2017. Similarly, 1,1-DCE concentrations increased from 21 µg/L in 2012 to a maximum detection of 130 µg/L in 2014 and then decreased to 60 µg/L in 2017. The results for 1,1-DCA and 1,1-DCE suggest that TCE is degrading at FT-PZ460I. Also at FT-PZ460I, PCE (not shown on the graph) was detected at a maximum concentration of 9.4 µg/L in 2012 but has decreased to 2.9 J µg/L 2017.

5.0 CONCLUSIONS AND RECOMMENDATIONS

The conclusions and recommendations are based on the 2017 supplemental investigation conducted at NWIRP Calverton.

Conclusions

- Groundwater flow to the south east has been confirmed by the water levels collected in 2017.
- VOCs have been detected on property (FT-MW02S, FT-MW03S, FT-MW09I, and FT-MW10I) at levels that exceed the NYSDOH MCLs during past sampling events. In 2017, VOCs were detected at concentrations less than NYSDOH MCLs except at one location. At FT-MW09I in 2017, 1,1-DCA was detected at 11.5 J µg/L.
- VOCs have been detected off property (FT-PZ458I, FT-PZ460I, and FT-PZ461I) at levels that exceed the NYSDOH MCLs during past sampling events. In 2017, results for FT-PZ458I were all less than the NYSDOH MCL. At FT-PZ460I in 2017, TCE was detected at 100 µg/L, 1,1-DCA at 23.2 µg/L, and 1,1-DCE at 60.4 µg/L all exceeding the similar NYSDOH MCL of 5 µg/L. At FT-PZ461I in 2017, TCE was detected at 20.5 µg/L exceeding the NYSDOH MCL of 5 µg/L.
- 1,4-Dioxane was detected in 5 of 31 sampled wells at concentrations ranging from 0.11J µg/L to 3.70 µg/L. Concentrations of 1,4-dioxane did not exceed the NYSDOH MCL of 50 µg/L.
- Trend analysis shows that concentrations of VOCs are generally decreasing over time. At FT-PZ460I, 1,1-DCA concentrations increased from 14 µg/L in 2012 to a maximum detection of 43 J µg/L in 2013 and then decreased to 23 µg/L in 2017. Similarly, 1,1-DCE concentrations increased from 21 µg/L in 2012 to a maximum detection of 130 µg/L in 2014 and then decreased to 60 µg/L in 2017. The results for 1,1-DCA and 1,1-DCE suggest that TCE is degrading at FT-PZ460I.

Recommendations

- Conduct a supplemental investigation in 2018 for VOCs and 1,4-dioxane to support the next 5-Year Review.

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6.0 References

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- Navy, 2017. Proposed Plan for Interim Remedy, Site 2 – Former Fire Training Area, Soil, Groundwater, and Potential Munitions and Explosives of Concern. February.
- NEESA (Naval Energy and Environmental Support Activity) 1986. Initial Assessment Study of NWIRP Bethpage, NY and NWIRP Calverton, NY. December.
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- Tetra Tech, 2001. Phase 2 Remedial Investigation for Site 2-Fire Training Area Naval Weapons Industrial Reserve Plant Calverton, New York, Contract No. N62472-90-D-1298 CTO 0270, February.
- Tetra Tech, 2016. Feasibility / Corrective Measures Study for Site 2 – Former Fire Training Area, Naval Weapons Industrial Reserve Plant, Calverton, New York, Contract No. N62470-08-D-1001, CTO WE63, September.
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TABLE 4-1
NOVEMBER 2017 GROUNDWATER ELEVATION DATA
SITE 2 - FORMER FIRE TRAINING AREA
NWIRP CALVERTON, NEW YORK

WELL ID	TOTAL DEPTH (FEET BTOC)	TOTAL DEPTH (FEET MSL)	WATER LEVEL November 2017 (FEET BTOC)	TOC (FEET MSL)	GROUND SURFACE ELEVATION (FEET MSL)	GROUNDWATER ELEVATION November 2017 (FEET MSL)	NOTES
SITE 2 - FIRE TRAINING AREA							
FT-MW01S	28.5	32.85	25.33	62.98	62.12	37.65	
FT-MW01I	78	-17.08	25.03	62.62	62.11	37.59	
FT-MW02S	20.5	33.95	16.94	54.45	53.34	37.51	
FT-MW02I	80	-16.16	16.83	54.31	53.26	37.48	
FT-MW03S	31.5	33.14	28.06	65.68	64.38	37.62	
FT-MW05S	17.5	30.68	13.05	50.39	49.37	37.34	
FT-MW05I	58	-9.13	13.47	50.77	49.87	37.30	
FT-MW06S	27	31.3	22.73	60.13	59.44	37.40	
FT-MW06I	75	-14.53	23.72	61.18	60.38	37.46	
FT-MW07S	35	32.73	31.69	69.17	68.33	37.48	
FT-MW08S	14	30.32	9.41	46.4	44.16	36.99	
FT-MW08I	33	11.04	9.52	46.65	44.32	37.13	
FT-MW09I	38	26.64	29.18	66.66	64.64	37.48	
FT-MW10I	30	24.74	18.94	56.72	54.74	37.78	
FT-PZ-451S	17.28	31.56	11.41	48.84	46.29	37.43	
FT-PZ-452S	16.17	33.16	11.98	49.33	46.24	37.35	
FT-PZ-453S	15.51	30.02	8.17	45.53	42.55	37.36	
FT-PZ-454S	14.85	31.16	9.35	46.01	43.33	36.66	
FT-PZ-455S	37.71	30.26	30.75	67.97	65.13	37.22	
FT-PZ-455I	75.38	-7.73	30.35	67.65	65.26	37.30	
FT-PZ-456S	15.06	29.18	9.05	44.24	41.75	35.19	
FT-PZ-456I	54.31	-9.99	9.19	44.32	42.00	35.13	
FT-PZ-457S	16.18	28.32	10.26	44.5	41.50	34.24	
FT-PZ-458S	16.11	23.41	5.05	39.52	36.76	34.47	
FT-PZ-458I	46.85	-8.29	5.27	38.56	36.73	33.29	
FT-PZ-459S	19.38	25.33	11.36	44.71	41.90	33.35	
FT-PZ-459I	48.31	-3.39	11.64	44.92	41.63	33.28	
FT-PZ-460I	52.41	-10.06	9.98	42.35	39.40	32.37	
FT-PZ-461I	61.35	-11.43	19.01	49.92	47.79	30.91	
FT-PZ-462S	14.71	27.05	5.67	41.76	39.79	36.09	
FT-PZ-462I	50.8	-8.63	--	42.17	39.91	--	Could not unlock
FT-PZ-463S	12.5	28.39	4.87	40.89	38.31	36.02	Dry, riser unscrewed
FT-PZ-463I	53.5	-12.44	7.39	41.06	38.31	33.67	
FT-PZ-464S	20	23.95	16.18	47.86	43.95	31.68	
FT-PZ-464I	49	-5.05	16.48	48.13	43.95	31.65	

BTOC - Below Top of Casing.

-- - Data not collected.

MSL - Mean Sea Level.

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TABLE 4-3
SUMMARY OF DETECTIONS IN GROUNDWATER FROM OFF-PROPERTY MONITORING WELLS
SITE 2 - FORMER FIRE TRAINING AREA
NWIRP CALVERTON, NEW YORK
PAGE 1 OF 2

LOCATION	NYSDOH Maximum Contaminant Level ⁽¹⁾	FT-PZ451S	FT-PZ452S	FT-PZ453S	FT-PZ454S	FT-PZ455I	FT-PZ455S	FT-PZ456I	FT-PZ456S	FT-PZ457S
SAMPLE ID		FT-PZ451S-20171129	FT-PZ452S-20171129	FT-PZ453S-20171202	FT-PZ454S-20171212	FT-PZ455I-20171202	FT-PZ455S-20171202	FT-PZ456I-20171204	FT-PZ456S-20171204	FT-PZ457S-20171204
VOCs (µg/L)										
1,1-Dichloroethane	5	NS	NS	NS	NS	NS	NS	0.5 U	0.5 U	NS
1,1-Dichloroethene	5	NS	NS	NS	NS	NS	NS	0.5 U	0.5 U	NS
cis-1,2-Dichloroethene	5	NS	NS	NS	NS	NS	NS	0.5 U	0.5 U	NS
Tetrachloroethene	5	NS	NS	NS	NS	NS	NS	0.5 U	0.5 U	NS
Trichloroethene	5	NS	NS	NS	NS	NS	NS	0.5 J	0.5 U	NS
SVOCs (µg/L)										
1,4-Dioxane	50	0.05 U	0.28 J	0.05 U	0.05 U					

1. The NYSDOH Part 5, Subpart 5-1 Public Water Systems, Table 3 Organic Chemicals, MCL Determination (November 2018).

Bolded values indicate exceedance of NYSDOH MCL values.

GW = Groundwater.

J = Estimated Value.

MCL = Maximum Contaminant Level.

NA = Not available.

NS = Not sampled.

NYSDOH = New York State Department of Health

SVOC - semi-volatile organic compounds.

VOCs - volatile organic compounds.

U = Not Detected.

ug/L = Microgram per liter.

TABLE 4-3
 SUMMARY OF DETECTIONS IN GROUNDWATER FROM OFF-PROPERTY MONITORING WELLS
 SITE 2 - FORMER FIRE TRAINING AREA
 NWIRP CALVERTON, NEW YORK
 PAGE 2 OF 2

LOCATION	NYSDOH Maximum Contaminant Level ⁽¹⁾	FT-PZ458I	FT-PZ458S	FT-PZ459I	FT-PZ459S	FT-PZ460I	FT-PZ461I		FT-PZ462I	FT-PZ462S
SAMPLE ID		FT-PZ458I-20171214	FT-PZ458S-20171214	FT-PZ459I-20171214	FT-PZ459S-20171214	FT-PZ460I-20171204	FT-PZ461I-20171204	FT-DUP06-20171204	FT-PZ462I-20171202	FT-PZ462S-20171202
VOCs (µg/L)										
1,1-Dichloroethane	5	0.5 U	0.5 U	NS	NS	23.2	0.96 J	0.93 J	NS	NS
1,1-Dichloroethene	5	0.5 U	0.5 U	NS	NS	60.4	0.82 J	0.82 J	NS	NS
cis-1,2-Dichloroethene	5	0.5 U	0.5 U	NS	NS	3.20 J	1.60 J	1.60 J	NS	NS
Tetrachloroethylene	5	0.5 U	0.5 U	NS	NS	2.90 J	0.48 J	0.47 J	NS	NS
Trichloroethylene	5	4.1 J	0.5 U	NS	NS	100	20.5	20.6	NS	NS
SVOCs (µg/L)										
1,4-Dioxane	50	0.46	0.05 U	0.05 U	0.06 U	3.20 J	1.00 J	1.00 J	0.05 U	0.05 U

1. The NYSDOH Part 5, Subpart 5-1 Public Water Systems, Table 3 Organic Chemicals, MCL Determination (November 2018).

Bolded values indicate exceedance of NYSDOH MCL values.

GW = Groundwater.

J = Estimated Value.

MCL = Maximum Contaminant Level.

NA = Not available.

NS = Not sampled.

NYSDOH = New York State Department of Health.

SVOC - semi-volatile organic compounds.

VOCs - volatile organic compounds.

U = Not Detected.

ug/L = Microgram per liter.

TABLE 4-2
SUMMARY OF DETECTIONS IN GROUNDWATER FROM ON-PROPERTY MONITORING WELLS
SITE 2 - FIRE TRAINING AREA
NWIRP CALVERTON, NEW YORK
PAGE 1 OF 2

LOCATION	NYSDOH Maximum Contaminant Level ⁽¹⁾	FTMW01I		FTMW01S	FTMW02I	FTMW02S	FTMW03S	FTMW05I	FTMW05S
		FT-MW-01I-20171130	FT-DUP02-20171130	FT-MW01S-20171130	FT-MW-02I-20171130	FT-MW02S-20171130	FT-MW03S-20171130	FT-MW05I-20171130	FT-MW05S-20171130
VOCs (µg/L)									
1,1,1-Trichloroethane	5	NS	NS	NS	0.75 U	0.75 U	4.8 J	NS	NS
1,1-Dichloroethane	5	NS	NS	NS	0.5 U	0.5 U	0.5 U	NS	NS
2- Butanone	50	NS	NS	NS	2.5 U	1.9 J	2.5 U	NS	NS
Acetone	50	NS	NS	NS	2.5 U	5 J	2.5 J	NS	NS
Ethyl Benzene	5	NS	NS	NS	0.5 U	0.94 J	0.5 U	NS	NS
o-Xylene	5	NS	NS	NS	0.5 U	2.2 J	0.5 U	NS	NS
Tetrachloroethene	5	NS	NS	NS	0.5 U	0.45 J	0.5 U	NS	NS
Toluene	5	NS	NS	NS	0.5 U	0.99 J	0.5 U	NS	NS
Trichloroethene	5	NS	NS	NS	0.5 U	0.5 U	0.41 J	NS	NS
Vinyl Chloride	2	NS	NS	NS	0.5 U	0.55 J	0.5 U	NS	NS
SVOCs (µg/L)									
1,4-Dioxane	50	0.05 U	0.05 U	0.05 UJ	0.05 U	0.05 UJ	0.05 U	0.05 U	0.05 U

1. The NYSDOH Part 5, Subpart 5-1 Public Water Systems, Table 3 Organic Chemicals, MCL Determination (November 2018).

Bolded values indicate exceedance of NYSDOH MCL values.

GW = Groundwater.

J = Estimated Value.

MCL = Maximum Contaminant Level.

NA = Not available.

NS = Not sampled.

NYSDOH = New York State Department of Health

SVOC - semi-volatile organic compounds.

VOCs - volatile organic compounds.

TABLE 4-2
SUMMARY OF DETECTIONS IN GROUNDWATER FROM ON-PROPERTY MONITORING WELLS
SITE 2 - FIRE TRAINING AREA
NWIRP CALVERTON, NEW YORK
PAGE 2 OF 2

LOCATION	NYSDOH Maximum Contaminant Level ⁽¹⁾	FTMW06I	FTMW06S	FTMW07S	FTMW08I	FTMW08S		FT-MW09I		FT-MW10I
		FT-MW-06I-20171130	FT-MW-06S-20171130	FT-MW-07S-20171130	FT-MW-08I-20171129	FT-MW08S-20171129	FT-DUP01-20171129	DUPLICATE	FT-MW09I-20171130	FT-DUP03-20171130
VOCs (µg/L)										
1,1,1-Trichloroethane	5	NS	NS	NS	NS	NS	NS	0.75 U	2.9 J	0.75 U
1,1-Dichloroethane	5	NS	NS	NS	NS	NS	NS	11.9	11.5	0.5 U
2- Butanone	50	NS	NS	NS	NS	NS	NS	2.5 U	2.5 U	2.5 U
Acetone	50	NS	NS	NS	NS	NS	NS	2.5 U	2.5 U	2.5 U
Ethyl Benzene	5	NS	NS	NS	NS	NS	NS	0.5 U	0.5 U	0.5 U
o-Xylene	5	NS	NS	NS	NS	NS	NS	0.5 U	0.5 U	0.5 U
Tetrachloroethene	5	NS	NS	NS	NS	NS	NS	0.5 U	0.5 U	0.5 U
Toluene	5	NS	NS	NS	NS	NS	NS	0.5 U	0.5 U	0.5 U
Trichloroethene	5	NS	NS	NS	NS	NS	NS	1.2 J	1 J	1.5 J
Vinyl Chloride	2	NS	NS	NS	NS	NS	NS	0.5 U	0.5 U	0.5 U
SVOCs (µg/L)										
1,4-Dioxane	50	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.12 J	0.11 J	0.05 U

1. The NYSDOH Part 5, Subpart 5-1 Public Water Systems, Table 3 Organic Chemicals, MCL Determination (November 2018).

Bolded values indicate exceedance of NYSDOH MCL values.

GW = Groundwater.

J = Estimated Value.

MCL = Maximum Contaminant Level.

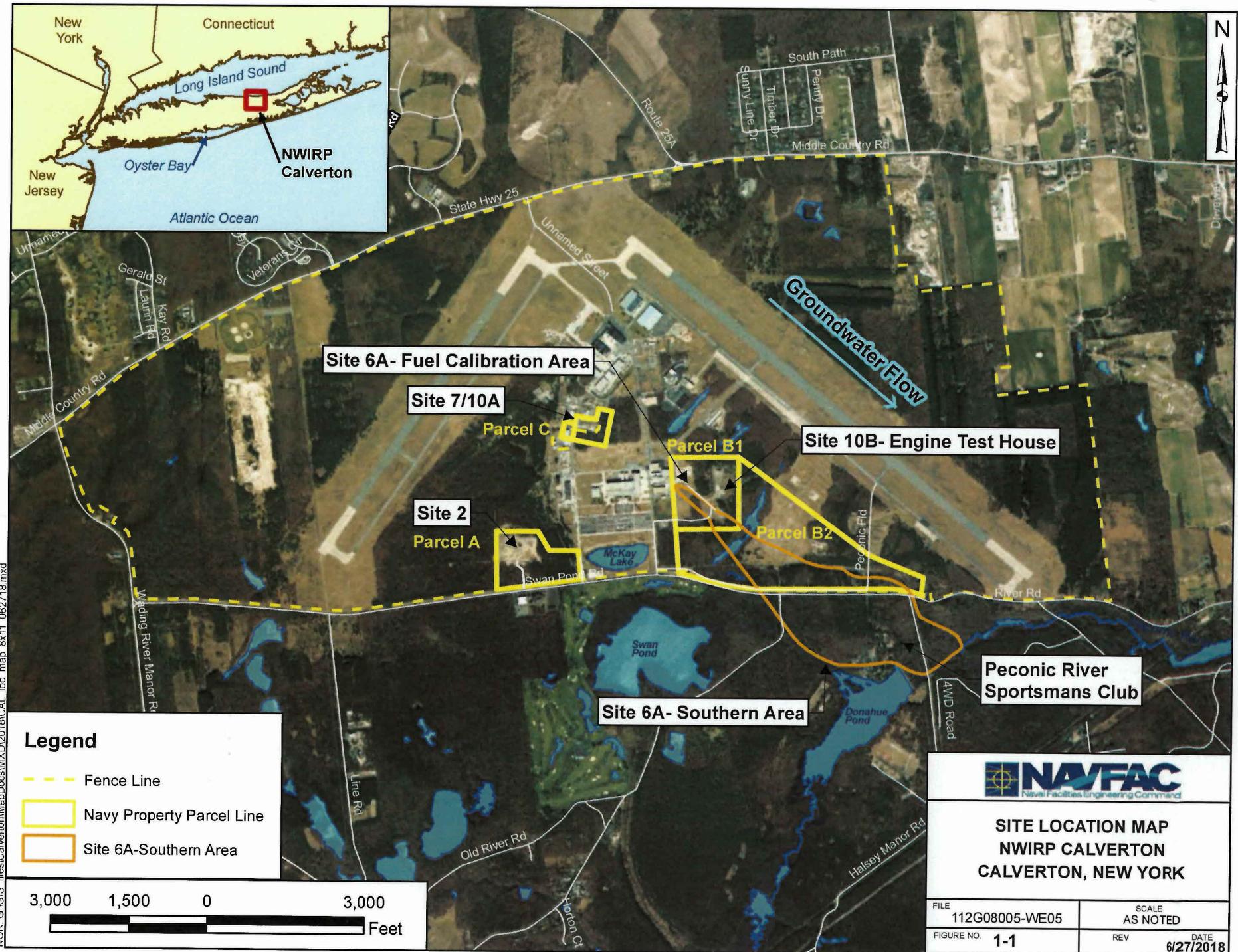
NA = Not available.

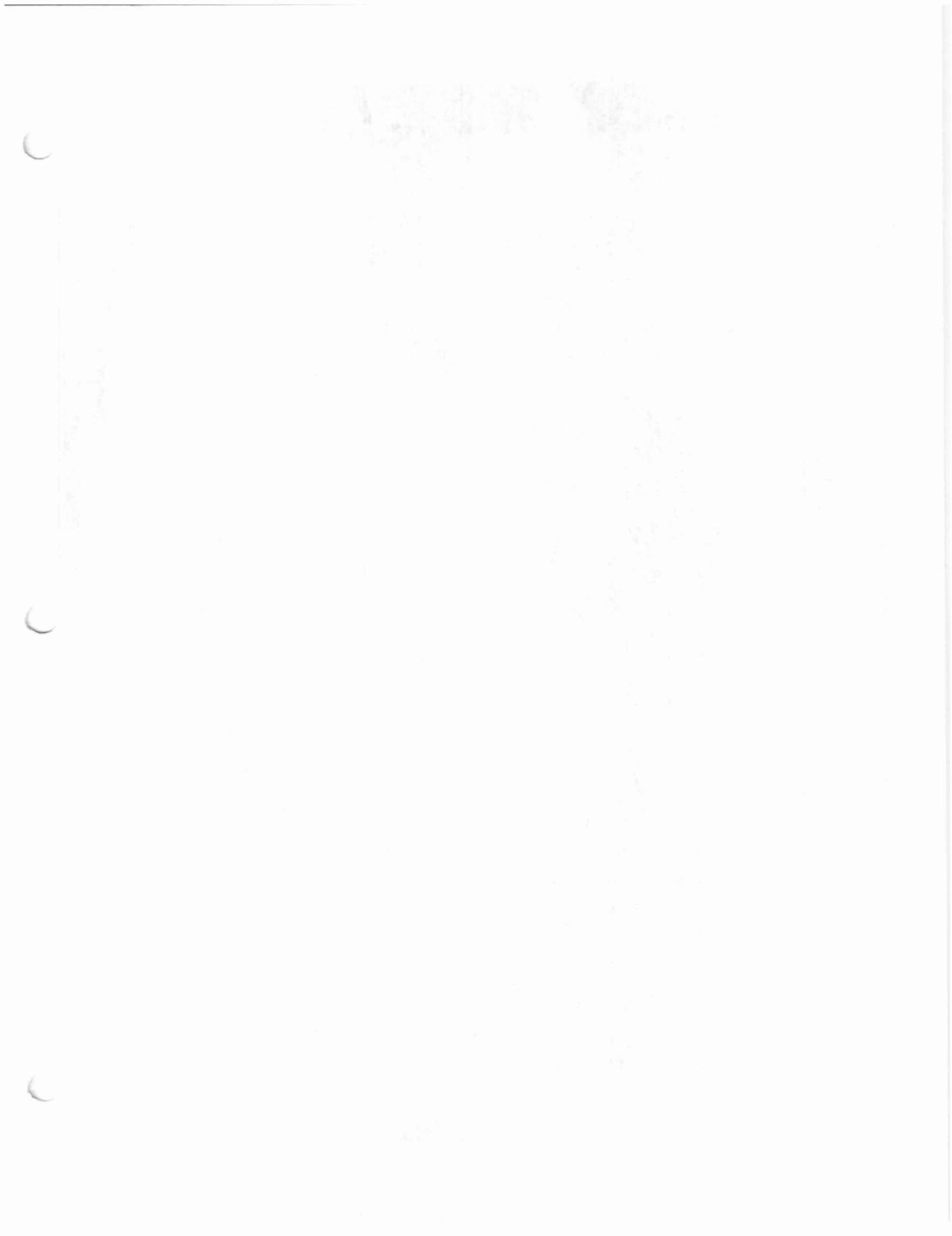
NS = Not sampled.

NYSDOH = New York State Department of Health

SVOC - semi-volatile organic compounds.

VOCs - volatile organic compounds.









Migration Pathways

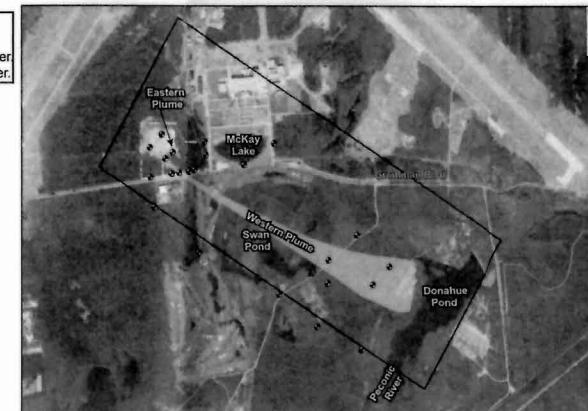
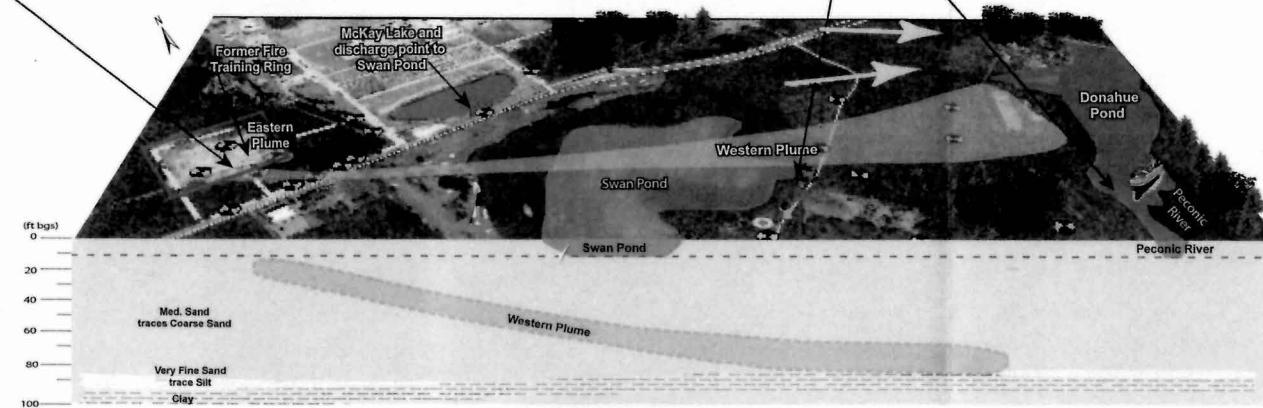
- Potential residual MEC excavated or unearthed by erosion.
- Potential leaching of xylenes (and other VOCs) or other sources (e.g. PFAS) to groundwater.
- Ingestion of groundwater contaminated with VOCs or possible exposure to VOCs through vapor intrusion into structures (if constructed) and inhalation.
- Groundwater to surface water 6,800 feet away (Peconic River).

Potential Offsite Receptor Residential Adult and Child

- VOC plume has not impacted the residential well.
- PFAS has not been detected above the EPA HA of 70 ng/L.

Potential Offsite Receptor Recreational User

- Potential migration of contaminants from groundwater to surface water
- Potential for ecological receptors if contamination migrates to the river.

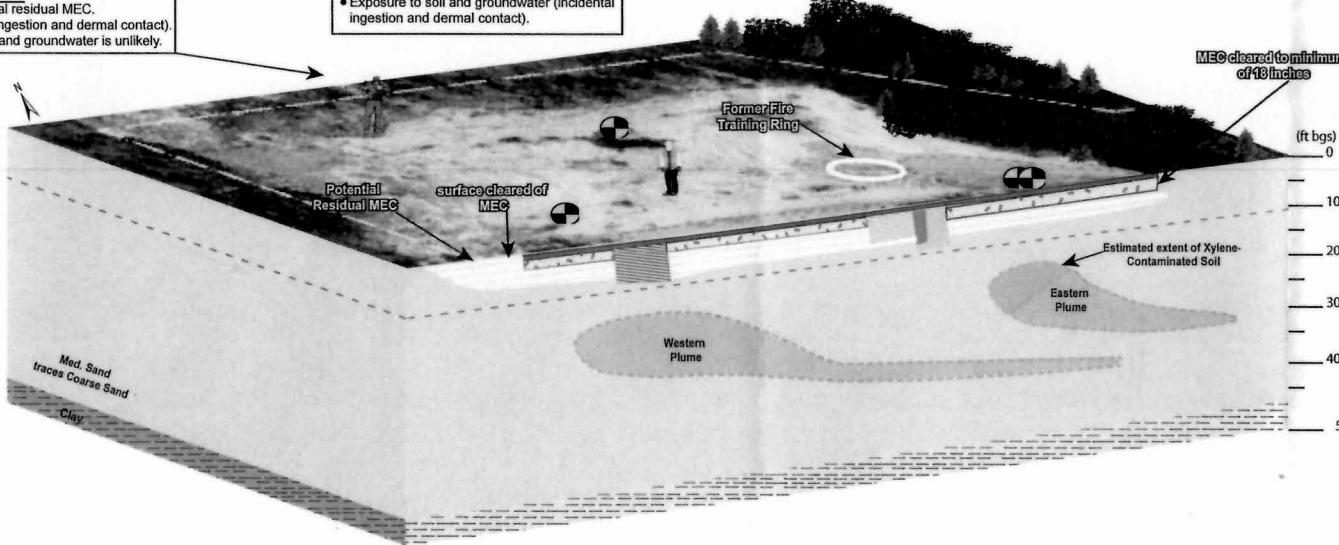


Current Receptor Recreational User or Trespasser

- Physical exposure to potential residual MEC.
- Exposure to soil (incidental ingestion and dermal contact).
- Exposure to subsurface soil and groundwater is unlikely.

Current Receptor Construction Worker

- Physical exposure to potential residual MEC.
- Exposure to soil and groundwater (incidental ingestion and dermal contact).



Notes:
EPA - Environmental Protection Agency
HA - Health Advisory
MEC - munitions and explosives of concern
PFAS - perfluoroalkyl substances
TCE - trichloroethene
VOCs - volatile organic compound

Legend
● Monitoring Well
- - - Water Table
→ Groundwater Flow
Very Sand trace Silt
Medium Sand traces Coarse Sand
Clay
Estimated extent of Xylene-Contaminated Solid
VOC Plume
Potential Residual MEC Impacted Soil
MEC Cleared Soil (18 inches)
2008/2009 Excavation
Burn Ring
2014 POL Removal Area (Offsite Disposal)
2014 PCB/POL Removal Area (Offsite Disposal)

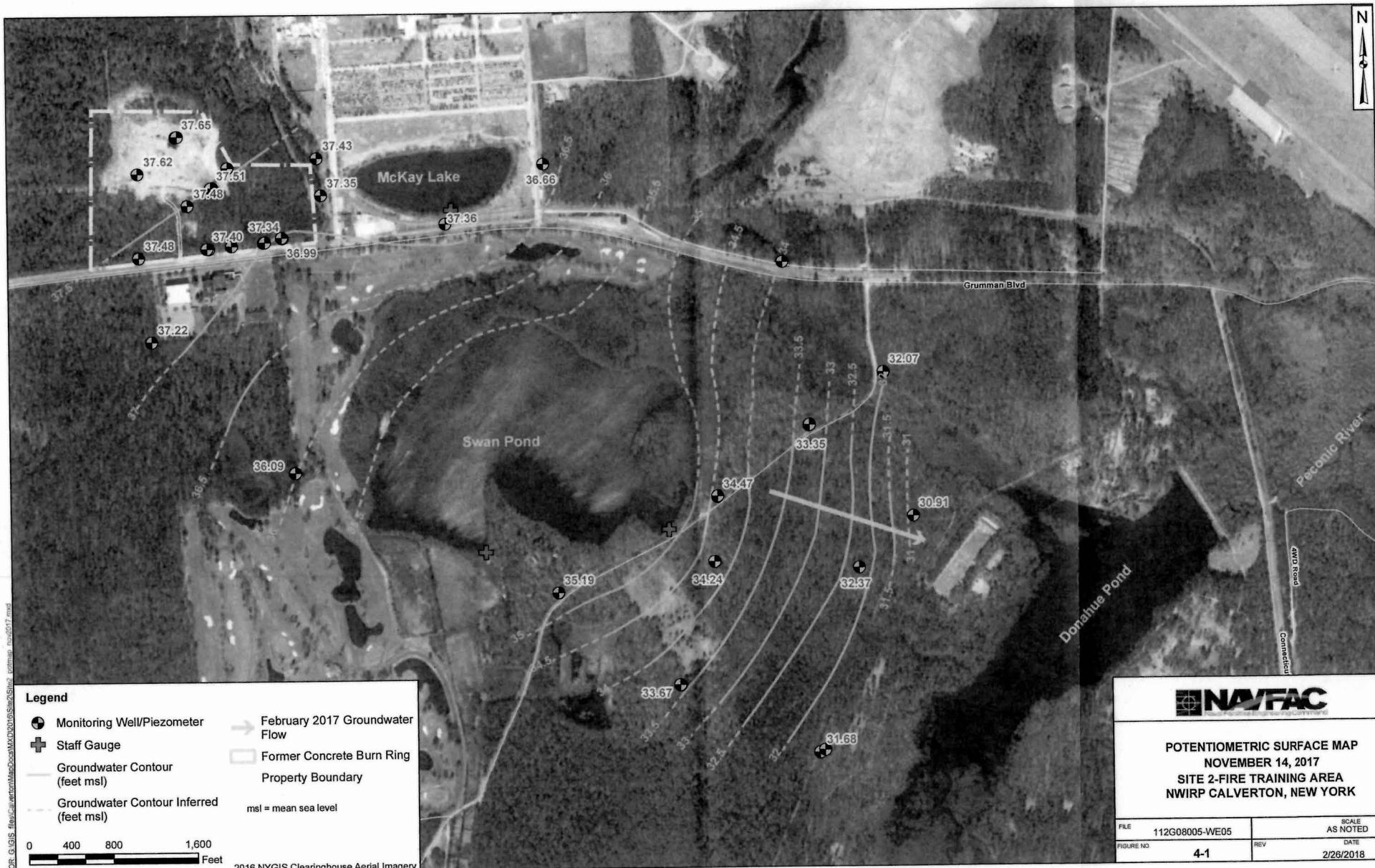
NOT TO SCALE



SITE 2
CONCEPTUAL SITE MODEL
NWIRP CALVERTON, NEW YORK

FILE 112G08005-WE05	SCALE AS NOTED
FIGURE NO. 2-3	REV DATE 11/8/2018

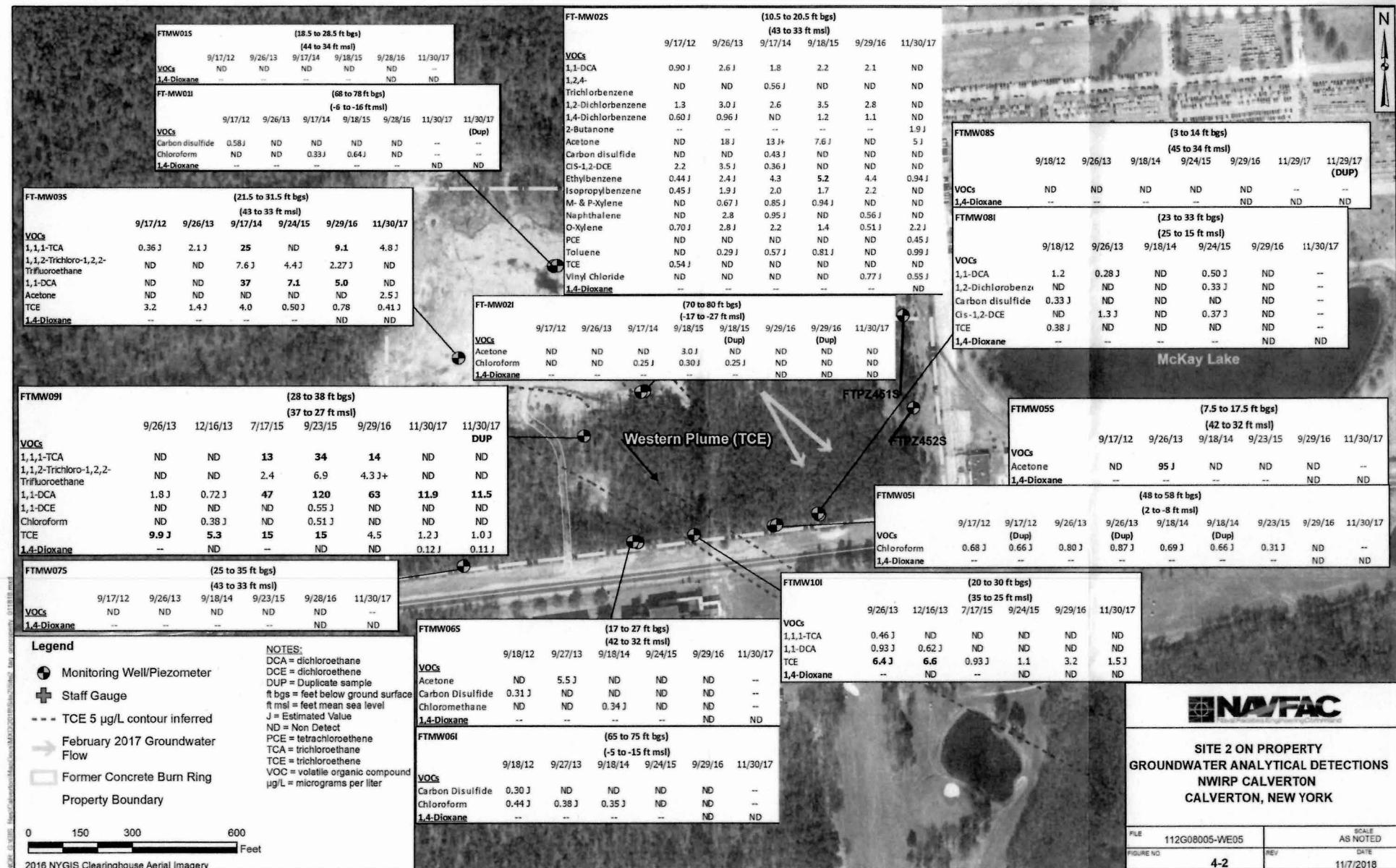




NAVFAC
Naval Facilities Engineering Command

POTENTIOMETRIC SURFACE MAP
NOVEMBER 14, 2017
SITE 2-FIRE TRAINING AREA
NWIRP CALVERTON, NEW YORK

FILE 112G08005-WE05	SCALE AS NOTED
FIGURE NO. 4-1	REV DATE 2/26/2018



SITE 2 ON PROPERTY
GROUNDWATER ANALYTICAL DETECTIONS
NWIRP CALVERTON
CALVERTON, NEW YORK

FILE	112G08005-WE05	SCALE	AS NOTED
FIGURE NO	4-2	REV	DATE
			11/7/2018

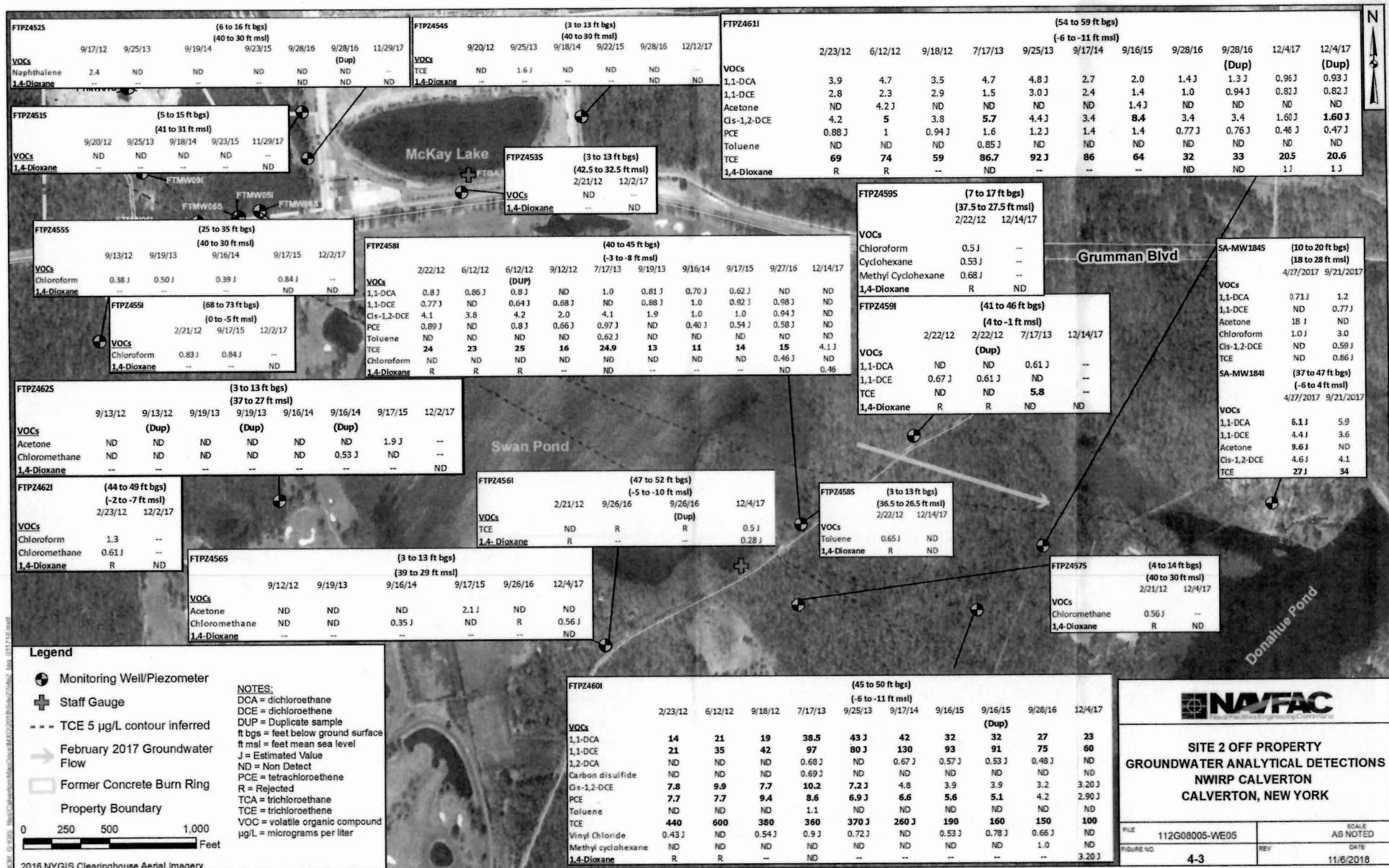


Figure 4-4: FTMW02S Trend Analysis
TCE, Xylenes, and Ethylbenzene
Site 2- Former Fire Training Area
NWIRP Calverton, New York

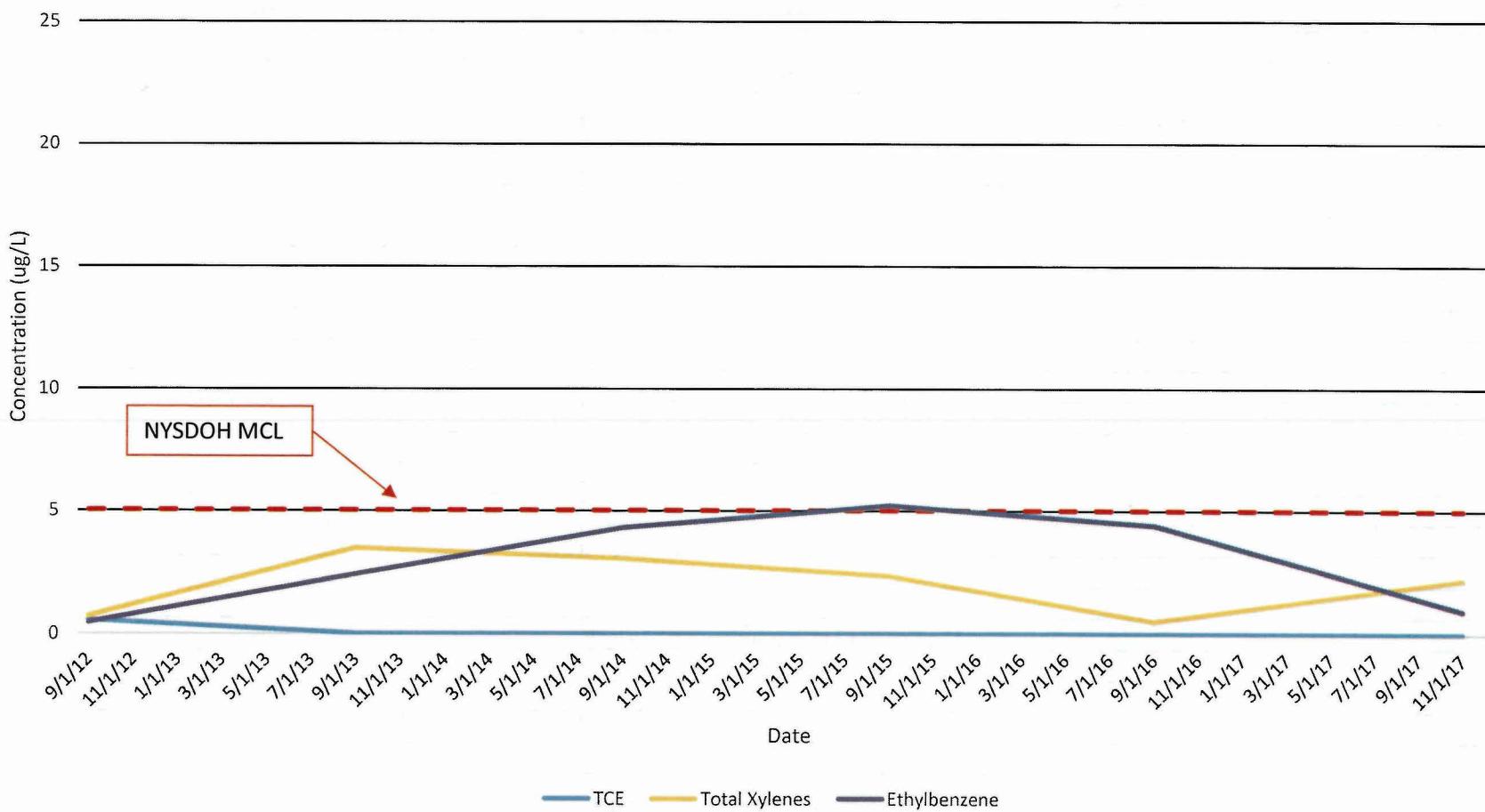


Figure 4-5: FT-MW03S Trend Analysis
TCE, TCA, and 1,1-DCA
Site 2- Former Fire Training Area
NWIRP Calverton, New York

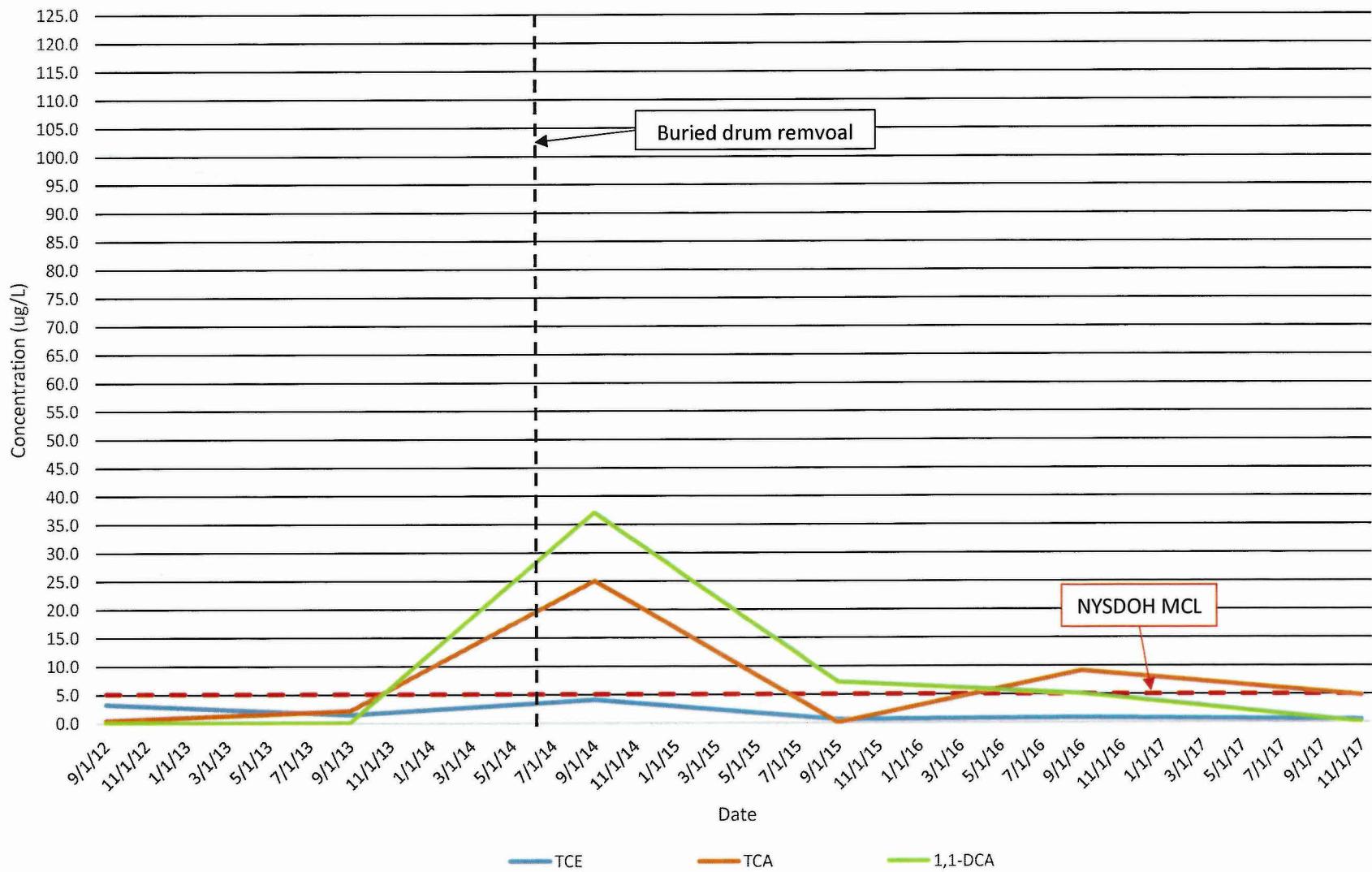


Figure 4-5: FT-MW03S Trend Analysis
TCE, TCA, and 1,1-DCA
Site 2- Former Fire Training Area
NWIRP Calverton, New York

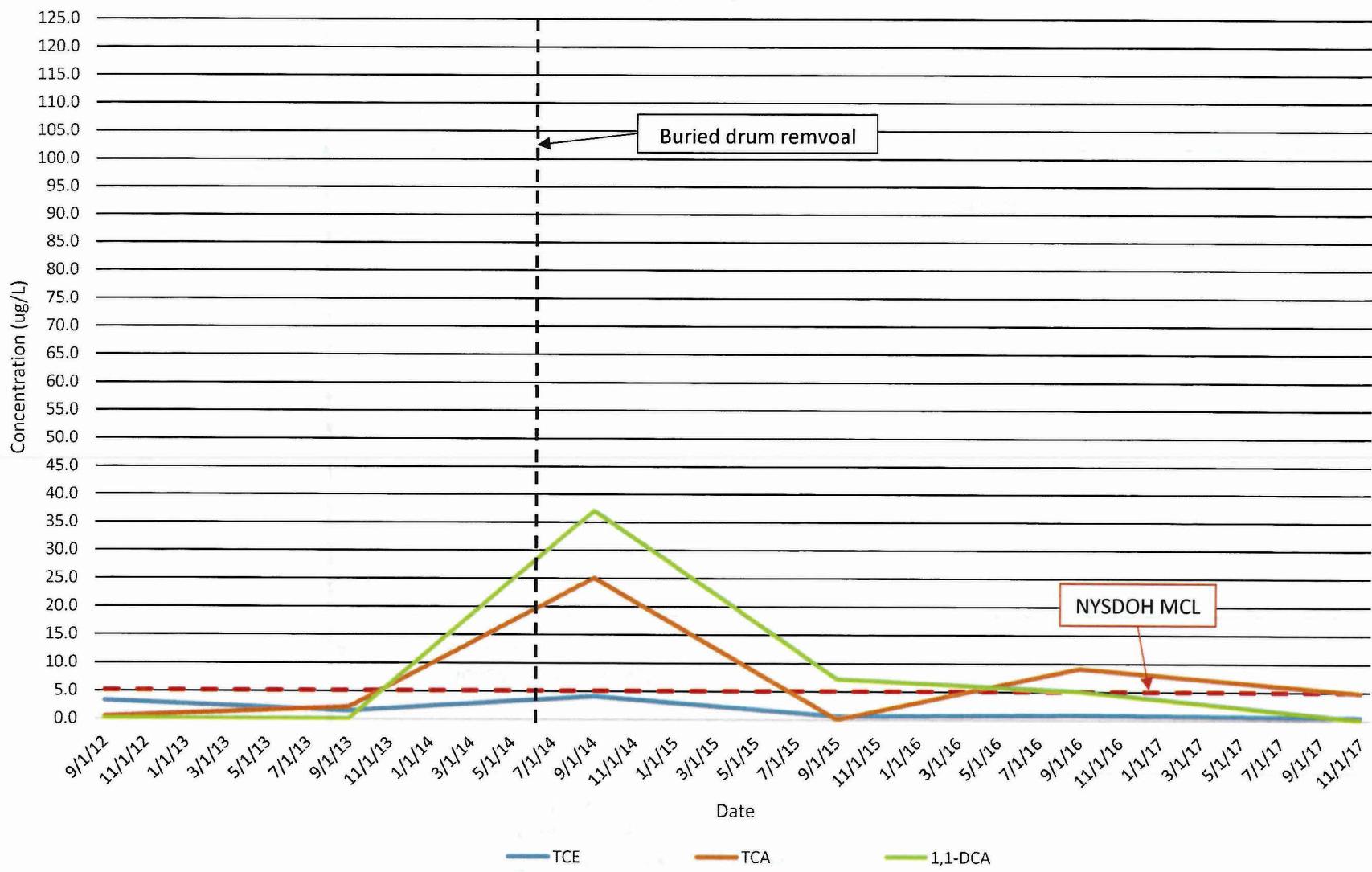


Figure 4-7: FT-MW10I Trend Analysis
TCE, TCA, and 1,1-DCA
Site 2- Former Fire Training Area
NWIRP Calverton, New York

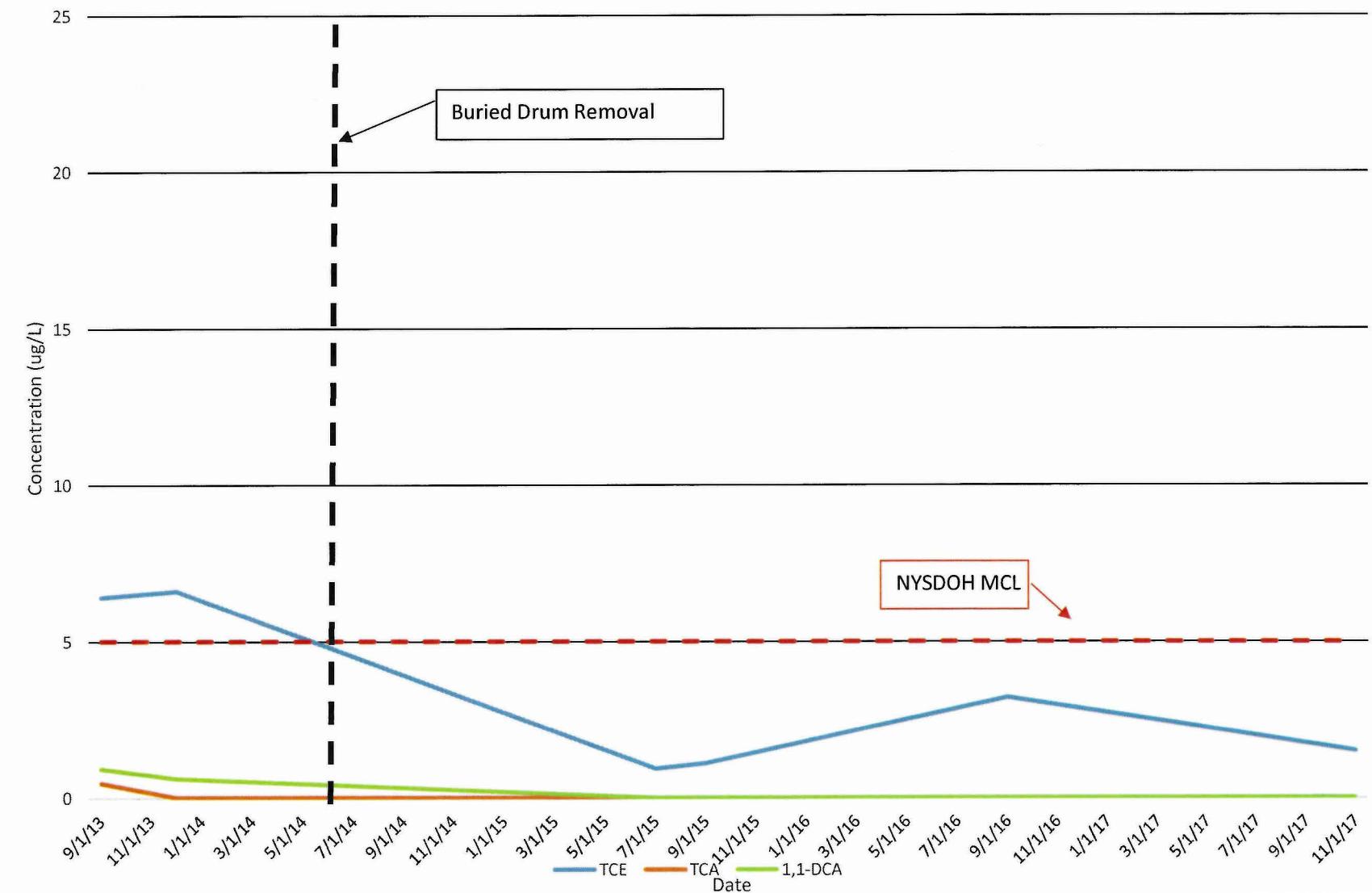


Figure 4-8: FT-PZ458I Trend Analysis
TCE, 1,1-DCA, and 1,1-DCE
Site 2 - Former Fire Training Area
NWIRP Calverton, New York

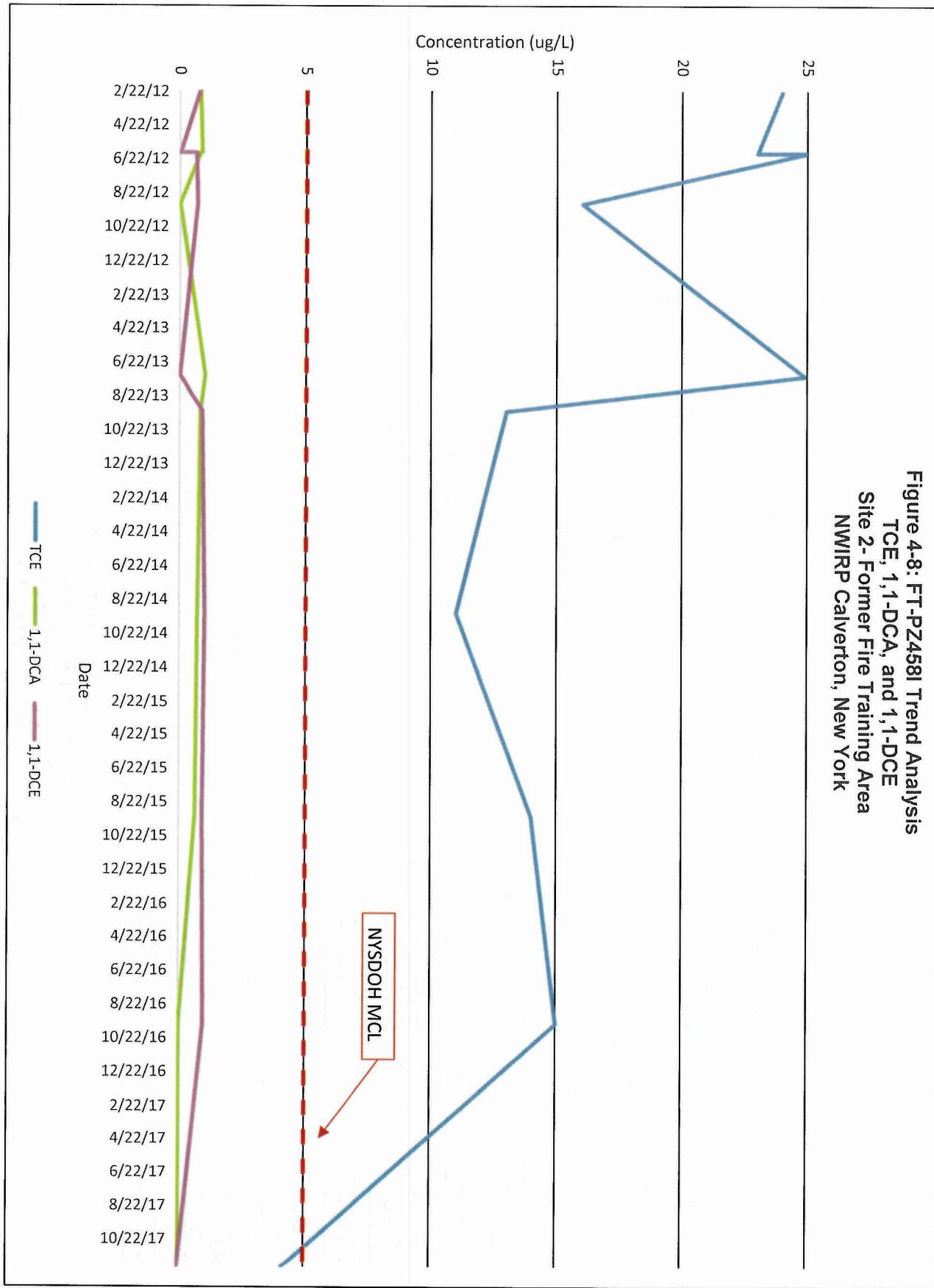
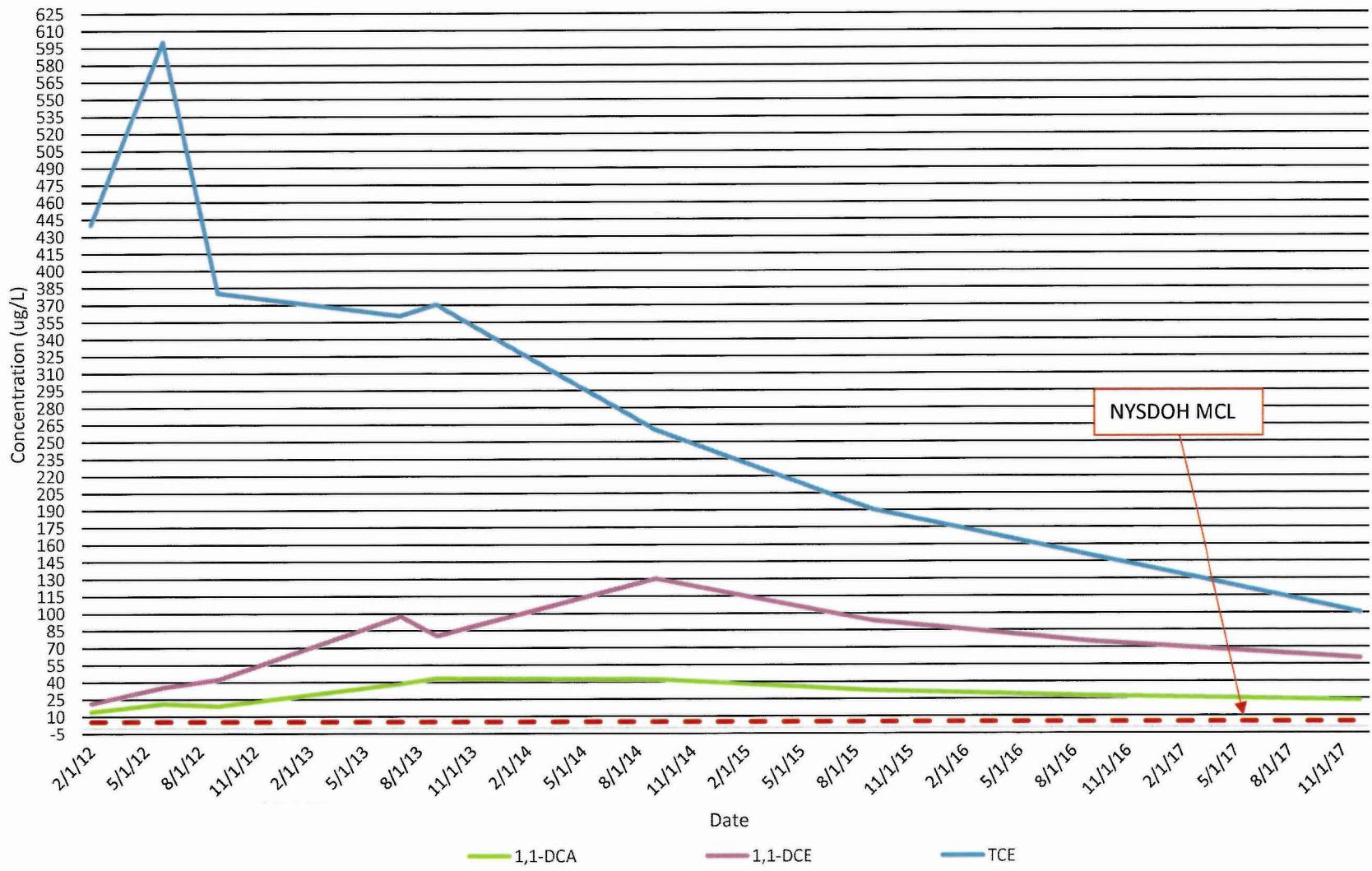
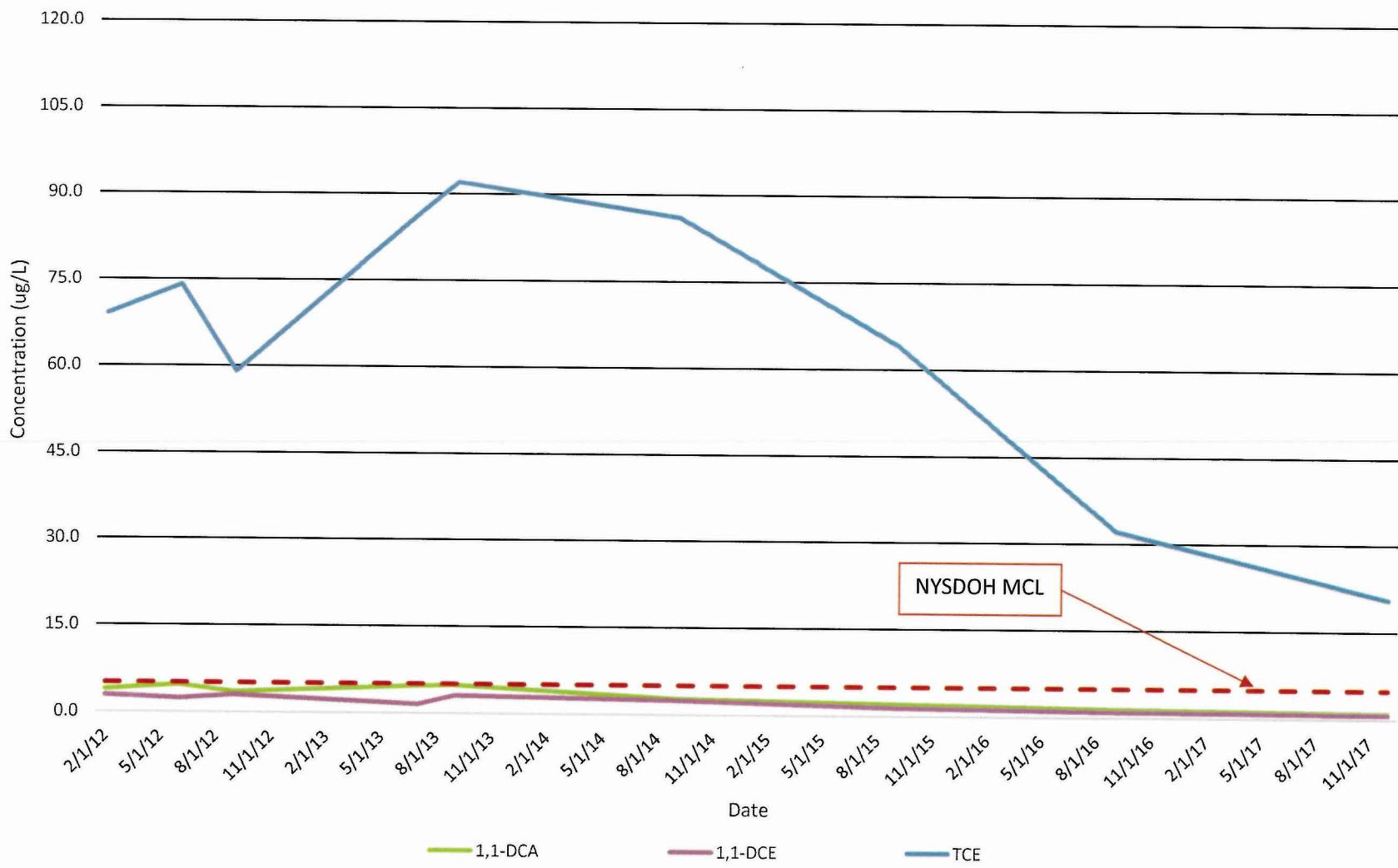


Figure 4-9: FT-PZ460I Trend Analysis
TCE, 1,1-DCA, and 1,1-DCE
Site 2- Former Fire Training Area
NWIRP Calverton, New York



**Figure 4-10: FTPZ461I Trend Analysis
TCE, 1,1-DCA, and 1,1-DCE
Site 2- Former Fire Training Area
NWIRP Calverton, New York**



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APPENDIX A

2017 SAMPLE LOG SHEETS

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GROUNDWATER LEVEL MEASUREMENT SHEET



TETRA TECH

Project Site Name:
Project No.:

NWIRP Calverton Site 2
112G03005-WE05

Weather Conditions:		<u>40° F Mostly Cloudy</u>		Personnel: <u>J. Birkett, S. Liang, L. Donston, B. Benfield</u>				
Tidally Influenced:	Yes	No	Measuring Device: <u>Solinst</u>					
Well or Piezometer No.	Date	Time	Elevation of Reference Point (feet)*	Total Well Depth (feet)*	Water Level (feet)*	Thickness of Free Product (feet)*	Groundwater Elevation (feet)*	Comments
FT-MW01S	11-14-17	1025			25.33			
FT-MW01I	↓	1025			25.03			
FT-MW02S	11-14-17	0950			16.94			
FT-MW02I	11-14-17	0950			16.83			
FT-MW03S		1030			28.06			
FT-MW05S		1036			13.65			
FT-MW05I		1036			13.47			
FT-MW06S		1054			22.73			
FT-MW06I	↓	1057			23.72			
FT-MW07S	11-14-17	1048			31.69			
FT-MW08S	↓	1109			9.41			
FT-MW08I		1109			9.62			
FT-MW09I		1336			29.18			
FT-MW10I		1100			18.94			no lock
FT-PZ-451S	11-14-17	1007			11.41			
FT-PZ-452S	11-14-17	1000			11.98			
FT-PZ-453S	↓	1310			8.17			
FT-PZ-454S		1327			9.35			
FT-PZ-455S		1145			30.75			tubing down no
FT-PZ-455I		1140			30.35			
FT-PZ-456S		—			9.05			
FT-PZ-456I		—			9.19			
FT-PZ-457S		—			10.62			
FT-PZ-458S		—			5.05			
FT-PZ-458I		—			5.27			
FT-PZ-459S		—			11.36			
FT-PZ-459I		—			11.64			
FT-PZ-460I		—			9.98			
FT-PZ-461I	↓	—			19.01			
FT-PZ-462S	11-14-17	1202			12025.67			
FT-PZ-462I	↓	—			Couldn't open			master lock
FT-PZ-463S		—			4.87			hard bottom
FT-PZ-463I		—			7.39			no water; bentonil
FT-PZ-464S		—			16.18			w/sav
FT-PZ-464I		—			16.48			
FTGA12	11-14-17	—			0.64			
SAPZ144S	↓	1050			9.43			
SAPZ144I		—			9.38			
FTGA13	11-14-17				0.74			

GROUNDWATER SAMPLE LOG SHEET



TETRA TECH

Event:	Calverton PFAS 2017
Project Site Name:	NWIRP Calverton
Project No.:	112G08005-WE05

Sample ID: FT-MW015 - 20171130	Sample By: BB										
QA/QC Duplicate ID: —	Sample Date: 11-30-17										
MS/MSD Collected: YES NO	Sample Time: 0945 0935										
WELL INFORMATION:											
Well ID: FT-MW015	Purge Date: 11-30-17										
Well Diameter (in): 4"	Static Water Level (ft-BTOR): 25.44										
Top of Screen (ft-BTOR): 18.5' bgs	PID Monitor Reading: 0.00										
Bottom of Screen (ft-BTOR): 28.5' bgs	Purge Method: Low Flow										
Total Well Depth (ft-BTOR): 32.86' MSL	Sample Method: Low Flow										
EQUIPMENT INFORMATION:											
Water Quality Instrument: Horiba U-52	Pump Controller: Monsoon										
Turbidity Meter: Lamotte 2020											
PURGE DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
0945	start purging										
0950	25.45	400	Clear	4.03	0.161	5.42	5.85	12.07	404	0.1	0.35±1
0955	25.46	400	Clear	4.35	0.157	5.07	4.85	13.12	385	0.1	1.05±1
0900		400		4.42	0.158	4.58	4.36	13.18	382	0.1	1.5±1
0905				4.44	0.162	4.22	4.49	13.16	381	0.1	2.6±1
0910				4.43	0.165	3.53	4.49	13.07	382	0.1	2.5±1
0915				4.43	0.170	3.80	5.71	13.40	382	0.1	3.0±1
0920				4.44	0.171	4.19	4.57	13.44	381	0.1	3.5±1
0925				4.46	0.170	3.83	3.45	13.45	380	0.1	4.0±1
0930	↓	↓	↓	4.46	0.172	3.85	3.37	13.20	379	0.1	4.5±1
0935	Collected Sample + MSL(Mo)										
FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total Vol. (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
0945	0930	45	4.5	4.46	0.172	3.85	3.37	13.20	379	0.1	—
ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS											
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected					
PFAS	537 modified	none	2	125-ml	poly	yes					
VOCs	SW-846 8260B	HCl	3	40-ml	glass	no					
1,4-dioxane	SW-846 8270D SIM	none	1	1-L	glass	yes					
OBSERVATIONS / NOTES:											
Pull tubing 2' off bottom											
Coordinates:	N	E	Signature(s): <i>RJ Bayle</i>								

GROUNDWATER SAMPLE LOG SHEET



TETRA TECH

Event: Calverton PFAS 2017
Project Site Name: NWIRP Calverton
Project No.: 112G08005-WE05

Sample ID: FT-MW011 - 20171130	Sampled By: JB
QA/QC Duplicate ID: FT-Dup02-20171130_0900	Sample Date: 11-30-17
MS/MSD Collected: YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	Sample Time: 0932

WELL INFORMATION:

Well ID : FT-MW011	Purge Date: 11-30-17
Well Diameter (in): 4"	Static Water Level (ft-BTOR): 25.09
Top of Screen (ft-BTOR): 68' bgs	PID Monitor Reading: 0.0
Bottom of Screen (ft-BTOR): 78 bgs	Purge Method: Low Flow
Total Well Depth (ft-BTOR): 78' 6" s	Sample Method: Low Flow

EQUIPMENT INFORMATION:

Water Quality Instrument:	Horiba U-52	Pump Controller:	Monsoon
Turbidity Meter:	Lamotte 2020		

PURGE DATA

FINAL PUBLISH / SAMPLE DATA

Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (°C)	ORP (mV)	Salinity (% or ppt)	Other
0845	0932	47	5.261	5.95	0.036	11.11*	3.44	11.43	321	22	-

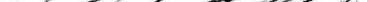
ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS

Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
PFAS	537 modified	none	2	125-ml	poly	yes
VOCs	SW-846 8260B	HCl	3	40-ml	glass	no
1,4-dioxane	SW-846 8270D SIM	—	1	1-L	glass	yes

OBSERVATIONS / NOTES:

Pull tubing 5' off bottom

* DO NOT reading properly

Coordinates: N E Signature(s): 

GROUNDWATER SAMPLE LOG SHEET



TETRA TECH

Event: Calverton PFAS 2017
Project Site Name: NWIRP Calverton
Project No.: 112G08005-WE05

Sample ID: FT-MW025-20171130	Sampled By: LD										
QA/QC Duplicate ID: -	Sample Date: 11-30-17										
MS/MSD Collected: YES (NO)	Sample Time: 0952										
WELL INFORMATION:											
Well ID: FT-MW025	Purge Date: 11-30-17										
Well Diameter (in): 4	Static Water Level (ft-BTOR): 17.03										
Top of Screen (ft-BTOR): 10.5	PID Monitor Reading: -										
Bottom of Screen (ft-BTOR): 20.5	Purge Method: Low Flow										
Total Well Depth (ft-BTOR): 20.5	Sample Method: Low Flow										
EQUIPMENT INFORMATION:											
Water Quality Instrument: Horiba U-52	Pump Controller: peristaltic										
Turbidity Meter: Lamotte 2020											
PURGE DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
0912	17.03	200	clear	6.50	0.438	0.00	9.60	11.65	-51	0.2	-
0917	16.91		clear	6.53	0.422	0.00	9.09	12.25	-57	0.2	-
0922	16.910			6.52	0.409	0.00	7.92	12.42	-57	0.2	-
0921				6.51	0.397	0.00	8.81	12.53	-58	0.2	-
0932				6.50	0.393	0.00	8.46	12.65	-59	0.2	-
0931				6.51	0.394	0.00	7.94	12.56	-59	0.2	-
0942				6.50	0.392	0.00	9.34	12.42	-61	0.2	-
0947				6.50	0.392	0.00	9.34	12.42	-61	0.2	-
0952	collect sample	-	-	-	-	-	-	-	-	-	-
FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
0912	0952	40	5	6.50	0.392	0.00	9.34	12.42	-61	0.2	-
ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS											
Analysis	Method		Preservative	Number	Vol.	Bottle Type	Collected				
PFAS	537 modified		none	2	125-ml	poly	y				
VOCs	SW-846 8260B		HCl	3	40-ml	glass	y				
1,4-dioxane	SW-846 8270D SIM		none	1	1L	glass (amt)	y				
OBSERVATIONS / NOTES:											
Pull tubing 1' off bottom		Smelly (organic) (petroleum odor) note Sheen on top of purge water.									
Coordinates:	N	E	Signature(s): <i>Lawton & Donlon</i>								

GROUNDWATER SAMPLE LOG SHEET



TETRA TECH

Event: Calverton PFAS 2017
Project Site Name: NWIRP Calverton
Project No.: 112G08005-WE05

FINAL PURGE / SAMPLE DATA:

Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
0818	0849	31	3	6.43	0.042	10.04	1.21	7.85	198	0.9	-

ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS

Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
PFAS	537 modified	none	2	125-ml	poly	y
VOCs	SW-846 8260B	none -HCl	3	40-ml	glass	y
1,4-dioxane	SW-846 8270D SIM	none	1	1 L	glass (comb)	y

OBSERVATIONS / NOTES:

Pull tubing 2' off bottom 0801 start on bottom to confirm. blow out air/unclog sediment.

Coordinates: N E Signature(s): *Lauren Donato*

GROUNDWATER SAMPLE LOG SHEET



TETRA TECH

Event: Calverton PFAS 2017
Project Site Name: NWIRP Calverton
Project No.: 112G08005-WE05

Sample ID: FT-rlw039-20171130				Sampled By: B.B Sample Date: 11-30-17 Sample Time: 10:30 1118							
QA/QC Duplicate ID: _____ MS/MSD Collected: YES <input checked="" type="checkbox"/> NO											
WELL INFORMATION:											
Well ID : FT-rlw039				Purge Date: 11-30-17							
Well Diameter (in): 4 1/2" 5 1/2" 4"				Static Water Level (ft-BTOR): 28.14							
Top of Screen (ft-BTOR): 21.5' 6 1/2"				PID Monitor Reading: 0.00							
Bottom of Screen (ft-BTOR): 31.5' 6 1/2"				Purge Method: Low Flow							
Total Well Depth (ft-BTOR): 31.5' 6 1/2"				Sample Method: Low Flow							
EQUIPMENT INFORMATION:											
Water Quality Instrument: Horiba U-52				Pump Controller: Monsoon							
Turbidity Meter: Lamotte 2020											
PURGE DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1030	Started	purge									
1032	28.15	400	Clear	6.40	6.426	6.33	22.6	12.21	231	0.2	0.5 gal
1032	28.15	400		6.51	0.427	5.85	26.2	12.25	201	0.2	1.0 gal
1042				6.59	0.429	5.65	20.6	12.46	193	0.2	1.5 gal
1047				6.61	0.425	5.37	19.2	12.75	193	0.2	2.0 gal
1052				6.57	0.421	5.94	12.6	13.30	193	0.2	2.5 gal
1057				6.40	0.417	5.42	9.14	13.19	191	0.2	3.0 gal
1102				6.61	0.415	5.39	6.87	12.32	190	0.2	3.5 gal
1107				6.61	0.413	5.35	5.58	13.30	190	0.2	4.0 gal
1112				6.62	0.412	5.36	4.59	13.52	187	0.2	4.5 gal
1117	✓	✓	✓	6.41	6.410	5.33	3.64	13.48	188	0.2	5.0 gal
1118	Collected sample										
FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total Vol. (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1030	1117	47	5.0	6.41	6.410	5.33	3.64	13.48	188	0.2	-
ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS											
Analysis	Method			Preservative	Number	Vol.	Bottle Type		Collected		
PFAS	537 modified			none	2	125-ml	poly		YES		
VOCs	SW-846 8260B			HCl	3	40-ml	glass		YES		
1,4-dioxane	SW-846 8270D SIM			Acne	1	1L	amber glass		YES		
OBSERVATIONS / NOTES:											
Pull tubing 2' off bottom											
Coordinates:		N		E		Signature(s):					

GROUNDWATER SAMPLE LOG SHEET



TETRA TECH

Event: Calverton PFAS 2017
Project Site Name: NWIRP Calverton
Project No.: 112G08005-WE05

Sample ID: FT-MW055-2011130	Sampled By: LD										
QA/QC Duplicate ID: —	Sample Date: 11-30-17										
MS/MSD Collected: YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	Sample Time: 1255										
WELL INFORMATION:											
Well ID : FT-MW055	Purge Date: 11-30-17										
Well Diameter (in): 4	Static Water Level (ft-BTOR): 13.14										
Top of Screen (ft-BTOR): 7.5	PID Monitor Reading: —										
Bottom of Screen (ft-BTOR): 17.5	Purge Method: Low Flow										
Total Well Depth (ft-BTOR): 17.5	Sample Method: Low Flow										
EQUIPMENT INFORMATION:											
Water Quality Instrument: Horiba U-52	Pump Controller: peristaltic										
Turbidity Meter: Lamotte 2020											
PURGE DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1215	13.14	250	CLEAR	start purge			—	—	—	—	—
1220	13.11			5.02	0.080	2.19	8.36	11.25	182	0.0	—
1225				4.98	0.078	2.12	8.52	11.56	189	0.0	—
1230				4.98	0.076	2.07	8.57	12.17	192	0.0	—
1235				5.03	0.074	1.82	7.20	12.26	192	0.0	—
1240				5.06	0.075	1.74	5.09	12.32	193	0.0	—
1245				5.08	0.074	1.67	4.71	12.34	193	0.0	—
1250				5-10	0.074	1.54	4.36	12.40	193	0.0	—
1255	Collect Sample			—	—	—	—	—	—	—	—
FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1215	1255	40	3	5.10	0.074	1.54	4.36	12.40	193	0.0	—
ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS											
Analysis	Method	Preservative		Number	Vol.	Bottle Type	Collected				
PFAS	537 modified	none		2	125-ml	poly	Y				
VOCs	SW-846 8260B	—		3	40-ml	glass	NO				
1,4-dioxane	SW-846 8270D SIM	none		1	1-L	glass (amb)	Y				
OBSERVATIONS / NOTES:											
Pull tubing 2' off bottom											
Coordinates:	N	E	Signature(s): <i>Lawren Donstott</i>								

GROUNDWATER SAMPLE LOG SHEET


TETRA TECH

Event: Calverton PFAS 2017
 Project Site Name: NWIRP Calverton
 Project No.: 112G08005-WE05

Sample ID: FT-MW05I-20171130		Sampled By: LD									
QA/QC Duplicate ID: —		Sample Date: 11-30-17									
MS/MSD Collected: YES (NO)		Sample Time: 1200									
WELL INFORMATION:											
Well ID: FT-MW05I		Purge Date: 11-30-17									
Well Diameter (in): 4		Static Water Level (ft-BTOR): 13.56									
Top of Screen (ft-BTOR): 48		PID Monitor Reading: —									
Bottom of Screen (ft-BTOR): 58		Purge Method: Low Flow									
Total Well Depth (ft-BTOR): 58		Sample Method: Low Flow									
EQUIPMENT INFORMATION:											
Water Quality Instrument: Horiba U-52		Pump Controller: peristaltic									
Turbidity Meter: Lamotte 2020											
PURGE DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1110	13.56	200	clear. Start purge.	—	—	—	—	—	—	—	—
1115	13.56	1		5.79	0.166	3.337	2.03	10.95	90	0.1	—
1120				5.64	0.165	3.24	1.67	11.07	115	0.1	—
1125				5.59	0.163	3.23	1.78	11.19	125	0.1	—
1130				5.54	0.162	3.18	1.68	11.24	137	0.1	—
1135				5.52	0.162	3.18	1.45	11.23	145	0.1	—
1140				5.50	0.162	3.16	1.65	11.27	152	0.1	—
1145				5.49	0.162	3.15	1.26	11.28	157	0.1	—
1150				5.49	0.160	3.21	1.32	11.25	162	0.1	—
1155				5.48	0.160	3.19	1.19	11.28	165	0.1	—
1200	Collect Sample	—	—	—	—	—	—	—	—	—	—
FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1117	1200	50	3	5.48	0.160	3.19	1.19	11.28	165	0.1	—
ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS											
Analysis	Method		Preservative	Number	Vol.	Bottle Type	Collected				
PFAS	537 modified		none	2	125-ml	poly	Y				
VOCs	SW-846 8260B		HCl	3	40-ml	glass	NO				
1,4-dioxane	SW-846 8270D SIM		none	1	1-L	glass (amb)	Y				
OBSERVATIONS / NOTES:											
Pull tubing 2' off bottom											
Coordinates:	N	E	Signature(s): <i>Laurie Weston</i>								

GROUNDWATER SAMPLE LOG SHEET


TETRA TECH

Event: Calverton PFAS 2017
 Project Site Name: NWIRP Calverton
 Project No.: 112G08005-WE05

Sample ID: FT-MW06S-20171130		Sampled By: J. Birkett									
QA/QC Duplicate ID:		Sample Date: 11-30-17									
MS/MSD Collected: YES NO		Sample Time: 1437									
WELL INFORMATION:											
Well ID: FT-MW06S		Purge Date: 11-30-17									
Well Diameter (in): 4"		Static Water Level (ft-BTOR): 22.78									
Top of Screen (ft-BTOR): 17' bgs		PID Monitor Reading: 0.0									
Bottom of Screen (ft-BTOR): 27' bgs		Purge Method: Low Flow									
Total Well Depth (ft-BTOR): 27' bgs		Sample Method: Low Flow									
EQUIPMENT INFORMATION:											
Water Quality Instrument: Horiba U-52					Pump Controller: Monsoon						
Turbidity Meter: Lamotte 2020											
PURGE DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1345	22.78		Start pump								
1350	22.78	400	clear	4.73	0.59	0.71	—	12.19	150	0.0	—
1355		400	clear	4.79	0.054	0.51	7.63	12.45	143	0.0	—
1400				4.80	0.053	0.79	3.45	12.52	131	0.0	—
1405				4.83	0.053	0.80	2.43	12.54	125	0.0	—
1410				4.85	0.052	0.76	1.62	12.56	121	0.0	—
1415				4.89	0.052	0.70	1.36	12.54	116	0.0	4.0 g/L
1420				4.94	0.052	0.71	0.86	12.53	110	0.0	—
1425				4.94	0.052	0.74	0.72	12.50	107	0.0	—
1430				4.97	0.051	0.80	0.49	12.54	103	0.0	—
1435	↓	↓	↓	4.98	0.051	0.83	0.38	12.57	100	0.0	—
1437			Collect sample								
FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1345	1437	52	6.5 gal	4.98	0.051	0.83	0.38	12.57	160	0.0	—
ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS											
Analysis	Method		Preservative		Number	Vol.	Bottle Type	Collected			
PFAS	537 modified		none		2	125-ml	poly	yes			
VOCs	SW-846 8260B		—		3	40-ml	glass	No			
1,4-dioxane	SW-846 8270D SIM		none		1	1-L	glass	yes			
OBSERVATIONS / NOTES:											
Pull tubing 3' off bottom											
Coordinates:	N	E	Signature(s):								

GROUNDWATER SAMPLE LOG SHEET


TETRA TECH

Event: Calverton PFAS 2017
 Project Site Name: NWIRP Calverton
 Project No.: 112G08005-WE05

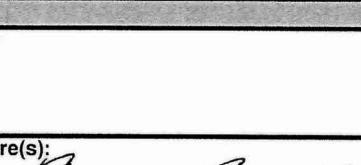
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QA/QC Duplicate ID: FRB		Sample Date: 11-30-17										
MS/MSD Collected: YES NO		Sample Time: 1322										
WELL INFORMATION:												
Well ID : FT-MW06I-20171130		Purge Date: 11-30-17										
Well Diameter (in): 4"		Static Water Level (ft-BTOR): 23.79										
Top of Screen (ft-BTOR): 65' bgs		PID Monitor Reading: 0.0										
Bottom of Screen (ft-BTOR): 75' bgs		Purge Method: Low Flow										
Total Well Depth (ft-BTOR): 75' bgs		Sample Method: Low Flow										
EQUIPMENT INFORMATION:												
Water Quality Instrument: Horiba U-52		Pump Controller: Morsan										
Turbidity Meter: Lamotte 2020												
PURGE DATA:												
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other	
1235	23.79	Start purge										
1240	23.82	400 clear	6.51	0.044	11.04	—	11.03	223	0.0	—		
1245	23.82		6.58	0.044	10.03	11.8	11.08	215	0.0	—		
1250			6.61	0.043	9.96	8.31	11.13	207	0.0	—		
1255			6.65	0.044	9.93	7.91	11.17	204	0.0	—		
1300			6.65	0.044	9.80	6.37	11.18	201	0.0	—		
1305			6.65	0.044	9.76	5.54	11.18	198	0.0	—		
1310			6.65	0.044	9.86	7.46	11.21	197	0.0	—		
1315			6.61	0.044	10.06	7.08	11.18	197	0.0	—		
1320		↓ ↓ ↓	6.59	0.044	10.13	7.00	11.19	198	0.0	—		
1322		Collect sample										
FINAL PURGE / SAMPLE DATA:												
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other	
1235	1322	47	5.5 gal							0.0	—	
ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS												
Analysis	Method		Preservative	Number	Vol.	Bottle Type	Collected					
PFAS	537 modified		none	2	125-ml	poly	yes					
VOCs	SW-846 8260B		—	3	40-ml	glass	no					
1,4-dioxane	SW-846 8270D SIM		none	1	1-L	glass	yes					
OBSERVATIONS / NOTES:												
Pull tubing 5' off bottom				FT-MW06I-FRB-20171130 (1322)								
Coordinates:		N	E	Signature(s):								

GROUNDWATER SAMPLE LOG SHEET



TETRA TECH

Event: Calverton PFAS 2017
Project Site Name: NWIRP Calverton
Project No.: 112G08005-WE05

Sample ID: FT-MW07S - 2017/11/30		Sampled By: BB									
QA/QC Duplicate ID: —		Sample Date: 11-30-17									
MS/MSD Collected: YES <input checked="" type="checkbox"/>		Sample Time: 11-30-1336									
WELL INFORMATION:											
Well ID : FT-MW07S		Purge Date: 11-30-17									
Well Diameter (in): 4'		Static Water Level (ft-BTOR): 31.77									
Top of Screen (ft-BTOR): 25' 6 ^{1/2}		PID Monitor Reading: 0.06									
Bottom of Screen (ft-BTOR): 35' 6 ^{1/2}		Purge Method: Low Flow									
Total Well Depth (ft-BTOR): 35' 6 ^{1/2}		Sample Method: Low Flow									
EQUIPMENT INFORMATION:											
Water Quality Instrument: Horiba U-52		Pump Controller: <u>Mangon</u>									
Turbidity Meter: Lamotte 2020											
PURGE DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (°C)	ORP (mV)	Salinity (% or ppt)	Other
1250	Started	<u>purging</u>									
1255	31.78	400	Clear	5.38	0.047	5.54	6.07	12.26	248	0.0	0.5 gal
1300	31.78		Clear	5.06	0.046	4.81	7.14	12.20	267	0.0	1.0 gal
1305				5.03	0.045	4.95	6.11	12.21	276	0.0	1.5 gal
1310				4.84	0.045	4.21	4.49	12.11	296	0.0	2.0 gal
1315				4.82	0.045	4.40	3.74	12.05	311	0.0	2.5 gal
1320				4.85	0.045	4.38	2.87	12.04	318	0.0	3.0 gal
1325				4.79	0.045	4.12	2.30	12.04	325	0.0	3.5 gal
1330				4.74	0.045	4.06	2.84	12.03	331	0.0	4.0 gal
1335	↓	↓	↓	4.71	0.045	3.99	2.03	12.03	335	0.0	4.5 gal
1336	Collect Sample										
FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total Vol. (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (°C)	ORP (mV)	Salinity (% or ppt)	Other
1250	1336	45	4.5	4.71	0.045	3.99	2.03	12.03	335	0.0	—
ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS											
Analysis	Method		Preservative		Number	Vol.	Bottle Type	Collected			
PFAS	537 modified		none		2	125-ml	poly	YES			
VOCs	SW-846 8260B		HCl		3	40-ml	glass	NO			
1,4-dioxane	SW-846 8270D SIM		none		1-L	1-L	glass	YES			
OBSERVATIONS / NOTES:											
Pull tubing 2' off bottom											
Coordinates:	N	E	Signature(s): 								

GROUNDWATER SAMPLE LOG SHEET



TETRA TECH

Event: Calverton PFAS 2017
 Project Site Name: NWIRP Calverton
 Project No.: 112G08005-WE05

Sample ID: FT-MW08S-20171129		Sampled By: J. Birkett									
QA/QC Duplicate ID: FT-Dup01-20171129 (P00)		Sample Date: 11-29-17									
MS/MSD Collected: YES NO		Sample Time: 1512									
WELL INFORMATION:											
Well ID: FT-MW08S-20171129 FRB		Purge Date: 11-29-17									
Well Diameter (in): 4		Static Water Level (ft-BTOR): 9.52									
Top of Screen (ft-BTOR): 4' bgs		PID Monitor Reading: 0.0									
Bottom of Screen (ft-BTOR): 14' bgs		Purge Method: Low Flow									
Total Well Depth (ft-BTOR): 14' bgs		Sample Method: Low Flow									
EQUIPMENT INFORMATION:											
Water Quality Instrument: Horiba U-52		Pump Controller: Peristaltic									
Turbidity Meter: Lamotte 2020											
PURGE DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1425	9.52		Start pump								
1430	9.52	300	clear	4.51	0.074	2.34	-	14.44	170	0.0	-
1435	9.52	" "	clear	4.46	0.070	2.00	3.91	14.19	180	0.0	-
1440				4.39	0.069	1.86	3.63	14.05	186		-
1445				4.32	0.069	1.69	3.03	13.99	191		-
1450				4.29	0.069	1.29	2.41	13.90	196		-
1455				4.26	0.068	1.03	1.87	13.83	201		-
1500				4.29	0.068	0.89	1.64	13.84	200		-
1505				4.29	0.067	0.72	1.53	13.80	203		-
1510		↓	↓	4.28	0.066	0.66	1.50	13.77	206	↓	-
1512			Collect Sample								
FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1425	1512	47	4 gal	4.28	0.066	0.66	1.50	13.77	206	0.0	-
ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS											
Analysis	Method		Preservative	Number	Vol.	Bottle Type	Collected				
PFAS	537 modified		none	2	125-ml	poly	yes				
VOCs	SW-846 8260B		HCl	3	40-ml	glass	no				
1,4-dioxane	SW-846 8270D SIM		none	1	1-L	amber glass	yes				
OBSERVATIONS / NOTES:											
Pull tubing 2' off bottom				FT-MW08S-FRB-20171129 1512							
Coordinates:		N	E	Signature(s):							

GROUNDWATER SAMPLE LOG SHEET



TETRA TECH

Event: Calverton PFAS 2017
Project Site Name: NWIRP Calverton
Project No.: 112G08005-WE05

Sample ID: FT-MWJ08E FT-MWJ08T-20171129	Sampled By: B33
QA/QC Duplicate ID: FT-MWJ08B —	Sample Date: 11/29/17
MS/MSD Collected: <input checked="" type="radio"/> YES <input type="radio"/> NO	Sample Time: 1428 1522 X0

WELL INFORMATION:

Well ID : FT-MW08I	Purge Date: 11-29-17
Well Diameter (in): 4"	Static Water Level (ft-BTOR): 9.59
Top of Screen (ft-BTOR): 23' bas	PID Monitor Reading: 0.6
Bottom of Screen (ft-BTOR): 33' bas	Purge Method: Low Flow
Total Well Depth (ft-BTOR): 33' bas	Sample Method: Low Flow

EQUIPMENT INFORMATION:

Water Quality Instrument: Horiba U-52 **Pump Controller:** Peristaltic
Turbidity Meter: Lamotte 2020

PURGE DATA:

FINAL PUBLISH / SAMPLE DATA:

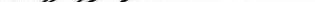
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (°C)	ORP (mV)	Salinity (% or ppt.)	Other
1428	1522	54	4.5	6.76	3.077	0.00	1.93	12.46	262	5.2	

ANALYSIS PRESERVATION AND BOTTLE REQUIREMENTS

ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS						
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
PFAS	537 modified	none	2	125-ml	poly	Yes
VOCs	SW-846 8260B	HCl	3	40-ml	glass	No
1,4-dioxane	SW-846 8270D SIM	none	1	1-L	glass	Yes

OBSERVATIONS / NOTES:

Pull tubing 1' off bottom

Coordinates:	N	E	Signature(s):
			

GROUNDWATER SAMPLE LOG SHEET



TETRA TECH

Event: Calverton PFAS 2017
Project Site Name: NWIRP Calverton
Project No.: 112G08005-WE05

Sample ID: FT-MW09T-20171130	(100)	Sampled By: J. Birkett									
QA/QC Duplicate ID: FT-MWFT-Dup03-20171130		Sample Date: 11-30-17									
MS/MSD Collected: YES	(NO)	Sample Time: 1122									
WELL INFORMATION:											
Well ID: FT-MW09T	Purge Date: 11-30-17										
Well Diameter (in): 2"	Static Water Level (ft-BTOR): 29.										
Top of Screen (ft-BTOR): 28' bgs	PID Monitor Reading: 0.0										
Bottom of Screen (ft-BTOR): 38' bgs	Purge Method: Low Flow										
Total Well Depth (ft-BTOR): 38' bgs	Sample Method: Low Flow										
EQUIPMENT INFORMATION:											
Water Quality Instrument: Horiba U-52	Pump Controller: Monsoon										
Turbidity Meter: Lamotte 2020											
PURGE DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (°C)	ORP (mV)	Salinity (% or ppt)	Other
1030	29.24	Start	purple								
1035	29.28	450	clear	5.81	0.90	10.64	—	10.18	226	0.0	—
1040	29.28	450	clear	5.96	0.99	8.81	101	11.00	222	0.0	—
1045				6.02	0.99	7.77	26.3	12.09	221	0.0	—
1050				6.03	0.102	7.32	21.4	12.10	222	0.0	—
1055				6.02	0.102	7.30	18.8	12.34	223	0.0	—
1100				6.04	0.104	7.28	13.3	12.40	223	0.0	—
1105				6.06	0.105	7.26	9.72	12.46	223	0.0	—
1110				6.05	0.105	7.24	7.15	12.55	226	0.0	—
1115				6.09	0.106	7.15	5.61	12.45	225	0.0	—
1120	↓	↓	↓	6.09	0.106	7.14	4.98	12.43	225	0.0	—
1122	Collect sample										
FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (°C)	ORP (mV)	Salinity (% or ppt)	Other
1030	1122	52	6.5 gal	6.09	0.106	7.14	4.98	12.43	225	0.0	—
ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS											
Analysis	Method		Preservative	Number	Vol.	Bottle Type	Collected				
PFAS	537 modified		none	2	125-ml	poly	yes				
VOCs	SW-846 8260B		HCl	3	40-ml	glass	yes				
1,4-dioxane	SW-846 8270D SIM		—	1	1 L	amber/glass	yes				
OBSERVATIONS / NOTES:											
Pull tubing 3' off bottom											
Coordinates:	N	E	Signature(s): 								

GROUNDWATER SAMPLE LOG SHEET



TETRA TECH

Event: Calverton PFAS 2017
Project Site Name: NWIRP Calverton
Project No.: 112G08005-WE05

Sample ID: FT-MW10I-20171130		Sampled By: LD									
QA/QC Duplicate ID: —		Sample Date: 11-30-17									
MS/MSD Collected: YES (NO)		Sample Time: 1406									
WELL INFORMATION:											
Well ID: FT-MW10I		Purge Date: 11-30-17									
Well Diameter (in): 2		Static Water Level (ft-BTOR): 19.01									
Top of Screen (ft-BTOR): 20		PID Monitor Reading: —									
Bottom of Screen (ft-BTOR): 30		Purge Method: Low Flow									
Total Well Depth (ft-BTOR): 30		Sample Method: Low Flow									
EQUIPMENT INFORMATION:											
Water Quality Instrument: Horiba U-52		Pump Controller: peristaltic									
Turbidity Meter: Lamotte 2020											
PURGE DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1326	19.02	—	Start purge			—	—	—	—	—	—
1331	19.01	~200	clear	0.19	0.092	0.04	7.13	11.53	142	0.0	—
1336			1	0.30	0.090	5.53	0.19	11.59	142	0.0	—
1341			1	0.30	0.081	4.16	5.71	11.61	145	0.0	—
1346			1	0.24	0.076	3.66	5.13	11.66	148	0.0	—
1351			1	0.27	0.015	3.60	3.81	11.70	148	0.0	—
1356			1	0.25	0.075	3.55	3.11	11.71	150	0.0	—
1401			1	0.24	0.075	3.51	2.30	11.71	152	0.0	—
1406	COLLECT SAMPLE	—	—	—	—	—	—	—	—	—	—
FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1326	1406	40	4	10.24	0.075	3.51	2.30	11.71	152	0.0	—
ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS											
Analysis	Method		Preservative		Number	Vol.	Bottle Type		Collected		
PFAS	537 modified		none		2	125-ml	poly		Y		
VOCs	SW-846 8260B		HCl		3	40-ml	glass		Y		
1,4-dioxane	SW-846 8270D SIM		none		1	1-L	glass (amb)		Y		
OBSERVATIONS / NOTES:											
Pull tubing 1' off bottom											
Coordinates:	N	E	Signature(s): <i>Lawren Donstans</i>								

GROUNDWATER SAMPLE LOG SHEET


TETRA TECH

Event: Calverton PFAS 2017
 Project Site Name: NWIRP Calverton
 Project No.: 112G08005-WE05

Sample ID: FT-PZ451S - 20171129		Sampled By: LD									
QA/QC Duplicate ID: —		Sample Date: 11-29-17									
MS/MSD Collected: YES NO		Sample Time: 1515									
WELL INFORMATION:											
Well ID : FT-PZ451S		Purge Date: 11-29-17									
Well Diameter (in): 1"		Static Water Level (ft-BTOR): 11.49'									
Top of Screen (ft-BTOR): 5		PID Monitor Reading: —									
Bottom of Screen (ft-BTOR): 15		Purge Method: Low Flow									
Total Well Depth (ft-BTOR): 15		Sample Method: Low Flow									
EQUIPMENT INFORMATION:											
Water Quality Instrument: Horiba U-52		Pump Controller: peristaltic									
Turbidity Meter: Lamotte 2020											
PURGE DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1422	11.49	Start purge, clear		—	—	—	—	—	—	—	—
1427	11.50	200	clear	6.04	0.073	1.77	26.2	15.00	192	0.0	—
1433		250		6.14	0.053	0.53	16.9	14.66	182	0.0	—
1438				6.15	0.050	0.30	9.68	14.49	179	0.0	—
1443				6.14	0.049	0.22	3.99	14.38	180	0.0	—
1448				6.28	0.050	0.02	2.10	14.05	173	0.0	—
1453				6.26	0.049	0.05	1.40	13.99	174	0.0	—
1458				6.25	0.049	0.20	1.04	13.98	175	0.0	—
1503	1500	collect sample	pump issues	—	—	—	—	—	—	—	—
1508	11.50	250	clear	6.35	0.050	1.78	4.14	13.91	171	0.0	—
1510	1	1	1	6.32	0.050	0.85	3.38	13.90	174	0.0	—
1515	Collect sample	—	—	—	—	—	—	—	—	—	—
FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1422	1515	4753	3	6.32	0.050	0.85	3.38	13.90	174	0.0	—
ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS											
Analysis	Method	Preservative		Number	Vol.	Bottle Type	Collected				
PFAS	537 modified	none		24	125-ml	poly	no				
VOCs	SW-846 8260B	—		3	40-ml	glass	no				
1,4-dioxane	SW-846 8270D SIM	none		1	1L	glass	yes				
OBSERVATIONS / NOTES:											
Pull tubing 2' off bottom											
Coordinates:	N	E	Signature(s): <i>Lauren Donstot</i>								

GROUNDWATER SAMPLE LOG SHEET


TETRA TECH

Event: Calverton PFAS 2017
 Project Site Name: NWIRP Calverton
 Project No.: 112G08005-WE05

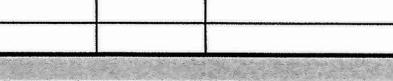
Sample ID: FT-PZ452S-2011129		Sampled By: LD									
QA/QC Duplicate ID: —		Sample Date: 11-29-17									
MS/MSD Collected: YES (NO)		Sample Time: 1630									
WELL INFORMATION:											
Well ID: FT-PZ452S		Purge Date: 11-29-17									
Well Diameter (in): 1 "		Static Water Level (ft-BTOR): 11.32									
Top of Screen (ft-BTOR): 6		PID Monitor Reading: —									
Bottom of Screen (ft-BTOR): 110		Purge Method: Low Flow									
Total Well Depth (ft-BTOR): 110		Sample Method: Low Flow									
EQUIPMENT INFORMATION:											
Water Quality Instrument: Horiba U-52		Pump Controller: peristaltic									
Turbidity Meter: Lamotte 2020											
PURGE DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL/min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1547	11.32	Start purge	clear	6.21	0.091	0.20	8.11	13.25	138	0.0	—
1552	12.09	200	clear	6.12	0.081	0.00	6.66	13.20	135	0.0	—
1557	12.05	175	clear	6.02	0.079	0.00	6.95	13.12	140	0.0	—
1602				6.07	0.082	0.00	4.23	13.15	135	0.0	—
1607				6.04	0.080	0.00	2.75	13.18	138	0.0	—
1612				6.02	0.079	0.00	6.95	13.12	140	0.0	—
1617				5.99	0.078	0.00	5.25	13.09	145	0.0	—
1622				5.99	0.078	0.00	3.34	13.10	146	0.0	—
1627				5.98	0.077	0.00	1.56	13.08	149	0.0	—
1630	COLLECT SAMPLE			—	—	—	—	—	—	—	—
FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal./L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1547	1630	43	3	5.98	0.077	0.00	1.56	13.08	149	0.0	—
ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS											
Analysis	Method	Preservative		Number	Vol.	Bottle Type	Collected				
PFAS	537 modified	none		2	125-ml	poly	no				
VOCs	SW-846 8260B	HCl		3	40-ml	glass	no				
1,4-dioxane	SW-846 8270D SIM	none		1	1 L	glass (Amber)	yes				
OBSERVATIONS / NOTES:											
Pull tubing 2' off bottom											
Coordinates:	N	E	Signature(s): <i>Lauren Donston</i>								

GROUNDWATER SAMPLE LOG SHEET



TETRA TECH

Event: Calverton PFAS 2017
Project Site Name: NWIRP Calverton
Project No.: 112G08005-WE05

Sample ID: FT-PZ453S-20171202	Sampled By: BB/LD										
QA/QC Duplicate ID: -	Sample Date: 12-02-17										
MS/MSD Collected: YES <input checked="" type="checkbox"/>	Sample Time: 1226										
WELL INFORMATION:											
Well ID: FT-PZ453S	Purge Date: 12-2-17										
Well Diameter (in): 1"	Static Water Level (ft-BTDR): 8.54										
Top of Screen (ft-BTDR): 5' 6 ¹ / ₂ "	PID Monitor Reading: 0.0										
Bottom of Screen (ft-BTDR): 13' 7 ¹ / ₂ "	Purge Method: Low Flow										
Total Well Depth (ft-BTDR): 13' 7 ¹ / ₂ "	Sample Method: Low Flow										
EQUIPMENT INFORMATION:											
Water Quality Instrument: Horiba U-52	Pump Controller: Peristaltic										
Turbidity Meter: Lamotte 2020											
PURGE DATA:											
Time (Hrs)	H ₂ O Level (ft-BTDR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1140	Start	Purge									
1145	8.63	200	Tan tint	5.76	0.102	0.22	14.00	11.95	79	0.0	—
1150	8.64			5.98	0.103	0.00	5.48	12.26	49	0.0	—
1155				6.03	0.103	0.00	4.96	12.43	39	0.0	organic
1200				6.05	0.103	0.00	3.80	12.50	34	0.0	—
1205				6.06	0.102	0.00	2.06	12.66	30	0.0	—
1210				6.07	0.102	0.00	1.43	12.85	26	0.0	—
1215				6.08	0.101	0.00	0.99	12.99	24	0.0	—
1220				6.09	0.101	0.00	1.07	13.10	22	0.0	—
1225	↓	↓	↓	6.09	0.101	0.00	0.81	13.12	21	0.0	—
1226	Sample collected										
FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1140	1226	46	4.5	6.09	0.101	0.00	0.81	13.12	21	0.0	—
ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS											
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected					
PFAS	537 modified	none	2	125-ml	poly	yes					
VOCs	SW-846 8260B	14C1	3	40-ml	glass	no					
1,4-dioxane	SW-846 8270D SIM	none	1	1-L	glass	yes					
OBSERVATIONS / NOTES:											
Pull tubing 2' off bottom		FT-PZ-453S-FRB-20171202 1226									
Coordinates:	N	E	Signature(s): 								

GROUNDWATER SAMPLE LOG SHEET



TETRA TECH

Event: Calverton PFAS 2017
Project Site Name: NWIRP Calverton
Project No.: 112G08005-WE05

FINAL PURGE / SAMPLE DATA:

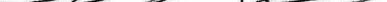
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (°C)	ORP (mV)	Salinity (% or ppt)	Other
1136	1223	47	4.5	5.92	0.111	0.34	2.52	13.98	151	0.1	-

ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS

Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
PFAS	537 modified	none	2	125-ml	poly	yes
VOCs	SW-846 8260B	HCl	3	40-ml	glass	no
1,4-dioxane	SW-846 8270D SIM	none	1	1-L	glass	yes

OBSERVATIONS / NOTES:

Pull tubing 2' off bottom

Coordinates:	N	E	Signature(s):
			

GROUNDWATER SAMPLE LOG SHEET



TETRA TECH

Event:

Calverton PFAS 2017

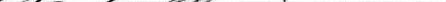
Project Site Name:

NWIRP Calverton

112G08005-WE05

OBSERVATIONS / NOTES:

Pull tubing off bottom

Coordinates: N E **Signature(s):** 

GROUNDWATER SAMPLE LOG SHEET


TETRA TECH

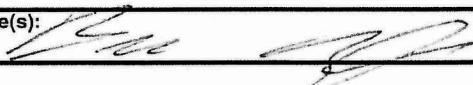
Event:	Calverton PFAS 2017
Project Site Name:	NWIRP Calverton
Project No.:	112G08005-WE05

Sample ID: <u>PZ FT-PZ455I-20171202</u>		Sampled By: <u>LD</u>									
QA/QC Duplicate ID: <u> </u>		Sample Date: <u>12-02-17</u>									
MS/MSD Collected: YES <u>(NO)</u>		Sample Time: <u>1045</u>									
WELL INFORMATION:											
Well ID: <u>FT-PZ455I</u>		Purge Date: <u>12-02-17</u>									
Well Diameter (in): <u>1"</u>		Static Water Level (ft-BTOR): <u>30.50'</u>									
Top of Screen (ft-BTOR): <u>08</u>		PID Monitor Reading: <u>0.0</u>									
Bottom of Screen (ft-BTOR): <u>73</u>		Purge Method: Low Flow									
Total Well Depth (ft-BTOR): <u>73</u>		Sample Method: Low Flow									
EQUIPMENT INFORMATION:											
Water Quality Instrument: Horiba U-52		Pump Controller: <u>peristaltic</u>									
Turbidity Meter: Lamotte 2020											
PURGE DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
0955	30.50	200	Clear	Start	Purge	-	-	-	-	-	-
1000	30.47	1	clear	6.57	0.046	7.04	-	8.14	165	0.0	-
1005	30.50	1		6.43	0.043	6.86	5.66	8.48	154	0.0	-
1010		1		6.39	0.042	6.16	3.05	8.76	151	0.0	-
1015		1		6.51	0.042	6.36	2.40	8.92	153	0.0	-
1020		1		6.33	0.041	11.36	2.30	9.13	159	0.0	-
1025		1		6.32	0.040	5.86	2.39	9.97	162	0.0	-
1030		1		6.33	0.040	5.82	2.41	9.82	162	0.0	-
1035		1		6.31	0.040	6.08	1.84	9.87	165	0.0	-
1040		1		6.31	0.040	6.79	1.50	9.68	168	0.0	-
1045		1		Collect sample		-	-	-	-	-	-
FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
0955	1045	50	3.5 gal	6.31	0.40	6.79	1.50	9.68	168	0.0	-
ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS											
Analysis	Method	Preservative		Number	Vol.	Bottle Type	Collected				
PFAS	537 modified	none		2	125-ml	poly	Y				
VOCs	SW-846 8260B	HCl		3	40-ml	glass	70				
1,4-dioxane	SW-846 8270D SIM	—		1	1L	glass (amber)	Y				
OBSERVATIONS / NOTES:											
Pull tubing 2' off bottom *bubbles in tubing											
Coordinates:	N	E	Signature(s): <u>Lanell J. Lee</u>								

GROUNDWATER SAMPLE LOG SHEET


TETRA TECH

Event: Calverton PFAS 2017
 Project Site Name: NWIRP Calverton
 Project No.: 112G08005-WE05

Sample ID: P1-P2456S-20171204		Sample By: BB									
QA/QC Duplicate ID:		Sample Date: 12-4-17									
MS/MSD Collected: YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>		Sample Time: 0855									
WELL INFORMATION:											
Well ID : FT-P2456S		Purge Date: 12-4-17									
Well Diameter (in): 1"		Static Water Level (ft-BTOR): 9.20									
Top of Screen (ft-BTOR): 3' 6.5		PID Monitor Reading: 0.00									
Bottom of Screen (ft-BTOR): 13' 6.5		Purge Method: Low Flow									
Total Well Depth (ft-BTOR): 13' long		Sample Method: Low Flow									
EQUIPMENT INFORMATION:											
Water Quality Instrument: Horiba U-52		Pump Controller: Peristaltic									
Turbidity Meter: Lamotte 2020											
PURGE DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
0754	start	pure									
0759	9.21	300	clear	4.53	0.041	4.82	1.29	10.42	292	0.0	—
0804	9.21		clear	4.53	0.038	4.87	1.75	11.48	303	0.6	—
0809				4.78	0.039	4.72	1.65	11.81	296	0.0	—
0814				4.68	0.037	4.49	0.85	11.87	307	0.0	—
0819				4.68	0.036	4.54	0.42	12.61	310	0.0	—
0824				4.69	0.036	4.58	0.76	12.10	312	0.0	—
0829				4.69	0.036	4.61	0.46	12.16	315	0.0	—
0834				4.70	0.036	4.59	0.30	12.19	317	0.0	—
0839	↓	↓	↓	4.70	0.036	4.54	0.26	12.18	319	0.0	—
0844				4.72	0.036	4.57	0.98	12.23	320	0.0	—
0849	↓	↓	↓	4.72	0.036	4.55	0.31	12.29	322	0.0	—
0855	collect sample										
FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal./L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
0754	0759	61	5.5	4.72	0.036	4.55	0.31	12.25	322	0.0	—
ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS											
Analysis	Method		Preservative	Number	Vol.	Bottle Type	Collected				
PFAS	537 modified		none	2	125-ml	poly	yes				
VOCs	SW-846 8260B		HCl	3	40-ml	glass	yes				
1,4-dioxane	SW-846 8270D SIM		none	1	1-L	glass	yes				
OBSERVATIONS / NOTES:											
Pull tubing 2' off bottom		split Sample w/ county									
Coordinates:		N	E	Signature(s): 							

GROUNDWATER SAMPLE LOG SHEET


TETRA TECH

Event: Calverton PFAS 2017
 Project Site Name: NWIRP Calverton
 Project No.: 112G08005-WE05

Sample ID: FT-PZ456I-120+ 20171204		Sampled By: LD									
QA/QC Duplicate ID:		Sample Date: 12-4-17									
MS/MSD Collected: YES (NO) FRB (850)		Sample Time: 0850									
WELL INFORMATION:											
Well ID: FT-PZ456I		Purge Date: 12-4-17									
Well Diameter (in): 1"		Static Water Level (ft-BTOR): 9.35									
Top of Screen (ft-BTOR): 47' bgs		PID Monitor Reading: 0.0									
Bottom of Screen (ft-BTOR): 52' bgs		Purge Method: Low Flow									
Total Well Depth (ft-BTOR): 52' bgs		Sample Method: Low Flow									
EQUIPMENT INFORMATION:											
Water Quality Instrument: Horiba U-52		Pump Controller: peristaltic									
Turbidity Meter: Lamotte 2020											
PURGE DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
0750	9.35	250	clear	5.87	0.054	0.00	17.0	9.11	94	0.0	-
0755	9.36	200	clear	5.91	0.054	0.00	13.9	9.40	86	0.0	-
0800				5.93	0.053	0.00	10.57	9.74	70	0.0	-
0810				5.94	0.052	0.00	7.86	9.91	63	0.0	-
0815				5.94	0.052	0.00	5.85	10.08	58	0.0	-
0820				5.95	0.052	0.00	6.65	10.20	56	0.0	-
0825				5.96	0.052	0.00	4.13	10.30	53	0.0	-
0830				5.96	0.052	0.00	3.40	10.40	49	0.0	-
0835				5.95	0.052	0.00	2.97	10.43	47	0.0	-
0840				5.96	0.051	0.00	2.97	10.55	45	0.0	-
0845				5.95	0.052	0.00	2.94	10.58	45	0.0	-
0850	Collect sample										
FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
0750	0850	60	4	5.95	0.052	0.00	2.94	10.58	45	0.0	-
ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS											
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected					
PFAS	537 modified	none	2	125-ml	poly	Y					
VOCs	SW-846 8260B	HCl	3	40-ml	glass	Y					
1,4-dioxane	SW-846 8270D SIM	none	1	1-L	glass (amber)	Y					
OBSERVATIONS / NOTES:											
Pull tubing 1' off bottom		FT-PZ456I-FRB-20171204		850		*split Sample w/ County					
Coordinates:	N	E	Signature(s): Lauren Donato								

GROUNDWATER SAMPLE LOG SHEET



TETRA TECH

Event: Calverton PFAS 2017
 Project Site Name: NWIRP Calverton
 Project No.: 112G08005-WE05

Sample ID: FT-PZ457S-20171204		Sampled By: LD									
QA/QC Duplicate ID: -		Sample Date: 12-04-17									
MS/MSD Collected: YES <input checked="" type="checkbox"/>		Sample Time: 1354									
WELL INFORMATION:											
Well ID: FT-PZ457S		Purge Date: 12-04-17									
Well Diameter (in): 1"		Static Water Level (ft-BTOR): 10.37									
Top of Screen (ft-BTOR): 4" bgs		PID Monitor Reading: 0.0									
Bottom of Screen (ft-BTOR): 14" bgs		Purge Method: Low Flow									
Total Well Depth (ft-BTOR): 14" bgs		Sample Method: Low Flow									
EQUIPMENT INFORMATION:											
Water Quality Instrument: Horiba U-52		Pump Controller: Peristaltic									
Turbidity Meter: Lamotte 2020											
PURGE DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1304	10.37	300	Clear	START PURGE	-	-	-	-	-	-	-
1309	1			5.02	0.059	04.21	9.49	12.88	204	0.0	-
1314				4.98	0.061	3.95	5.16	12.98	225	0.0	-
1319	↓	↓	↓	4.94	0.061	3.83	2.66	13.00	244	0.0	-
1324				4.93	0.062	3.77	1.46	13.04	252	0.0	-
1329				4.94	0.062	3.74	1.53	13.06	260	0.0	-
1334	↓	↓	↓	4.94	0.062	3.72	0.76	13.07	269	0.0	-
1339				4.95	0.062	3.71	0.65	13.09	275	0.0	-
1344	↓	↓	↓	4.95	0.062	3.70	0.62	13.09	280	0.0	-
1349	↓	↓	↓	4.93	0.063	3.66	-	13.10	286	0.0	-
1354	Collect Sample			-	-	-	-	-	-	-	-
FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1304	1354	50	3	4.93	0.063	3.66	0.62	13.10	286	0.0	-
ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS											
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected					
PFAS	537 modified	none	2	125-ml	poly	no					
VOCs	SW-846 8260B	HCl	3	40-ml	glass	no					
1,4-dioxane	SW-846 8270D SIM	none	1	1-L	glass (amber)	y					
OBSERVATIONS / NOTES:											
Pull tubing 3' off bottom split sample w/ county											
Coordinates:	N	E	Signature(s): <i>Laurie Donster</i>								

GROUNDWATER SAMPLE LOG SHEET



TETRA TECH

Event:	Calverton PFAS 2017
Project Site Name:	NWIRP Calverton
Project No.:	112G08005-WE05

Sample ID:	FT-PZ458S-20171214	Sampled By:	LD
QA/QC Duplicate ID:	No	Sample Date:	12/14/17
MS/MSD Collected:	NO	Sample Time:	9:13:00 AM

WELL INFORMATION:

Well ID :	FT-PZ458S	Purge Date:	12/14/17
Well Diameter (in):	1	Static Water Level (ft-BTOR):	
Top of Screen (ft-BTOR):	3	PID Monitor Reading:	0
Bottom of Screen (ft-BTOR):	13	Purge Method:	Low Flow
Total Well Depth (ft-BTOR):	13	Sample Method:	Low Flow

EQUIPMENT INFORMATION:

Water Quality Instrument:	Horiba U-52	Pump Controller:	Peristaltic
Turbidity Meter:	Lamont's 2020 — Lamotte 2020		

PURGE DATA:

Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
8:23	5.36	Start purge									
8:28	5.41	250	Yellow	4.01	0.067	2.35	0.92	9.08	190	0.00	Organic smell
8:33	5.41	250	Yellow	3.94	0.062	0.07	0.97	9.08	189	0.00	Organic smell
8:38	5.41	250	Yellow	3.83	0.059	0.00	Nm	9.28	191	0.00	Organic smell
8:43	5.41	250	Yellow	3.73	0.058	0.00	0.73	9.26	194	0.00	Organic smell
8:48	5.41	250	Yellow	3.63	0.057	0.00	0.83	9.29	196	0.00	Organic smell
8:53	5.41	250	Yellow	3.59	0.057	0.00	0.75	9.28	196	0.00	Organic smell
8:58	5.41	250	Yellow	3.57	0.056	0.00	1.10	9.18	196	0.00	Organic smell
9:03	5.41	250	Yellow	3.57	0.056	0.00	1.59	9.20	195	0.00	Organic smell
9:08	5.41	250	Yellow	3.57	0.056	0.00	1.19	9.31	194	0.00	Organic smell
9:13	Collect sample										

FINAL PURGE / SAMPLE DATA:

Start Purge	End Purge	Total Vol. (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
8:23	9:13	50	5	3.57	0.056	0.00	1.19	9.31	194	0.00	Organic smell

ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS

Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
PFAS	537 modified	None	2	125-mL	Poly	Yes
VOCs	SW-846 8260B	HCl	3	40-mL	Glass	Yes
1,4-dioxane	SW-846 8270D SIM	None	1	1-L	Glass Amber	Yes

OBSERVATIONS / NOTES:

Pull tubing 2 feet off bottom

Split samples with county

Coordinates:	N	E	Signature(s): <i>Rawson Donston</i>

GROUNDWATER SAMPLE LOG SHEET



TETRA TECH

Event: Calverton PFAS 2017
 Project Site Name: NWIRP Calverton
 Project No.: 112G08005-WE05

Sample ID: FT-82458I-20171214		Sample By: BB									
QA/QC Duplicate ID:		Sample Date: 12/14/17									
MS/MSD Collected: YES (NO)		Sample Time: 0907									
WELL INFORMATION:											
Well ID: FT-82458I		Purge Date: 12/14/17									
Well Diameter (in): 11"		Static Water Level (ft-BTOR): 5.30									
Top of Screen (ft-BTOR): 40'		PID Monitor Reading: 0.00									
Bottom of Screen (ft-BTOR): 45'		Purge Method: Low Flow									
Total Well Depth (ft-BTOR): 45'		Sample Method: Low Flow									
EQUIPMENT INFORMATION:											
Water Quality Instrument: Horiba U-52		Pump Controller: Peristaltic									
Turbidity Meter: Lamotte 2020											
PURGE DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
0820 start purge											
0828	5.31	30s	Clear	5.95	0.170	0.00	211	13.86	66	0.1	-
0830	5.32		Clear	5.93	0.275	0.00	11.78	12.80	44	0.1	-
0835	5.32			5.93	0.227	0.00	7.51	12.11	36	0.1	-
0840	5.32		Clear	5.95	0.221	0.00	4.73	11.67	30	0.1	-
0845				5.93	0.227	0.00	2.58	11.35	27	0.1	-
0855				5.93	0.231	0.00	2.47	11.11	24	0.1	-
0855				5.91	0.232	0.00	1.73	10.96	22	0.1	-
0900	5.30			5.96	0.234	0.00	1.65	10.63	18	0.1	-
0905	↓	↓	↓	5.92	0.233	0.00	1.70	10.49	18	0.1	-
0907	Calvert Sample										
FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
0820	0907	47	4.5	5.62	0.233	0.00	1.79	10.49	18	0.1	-
ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS											
Analysis	Method		Preservative		Number	Vol.	Bottle Type	Collected			
PFAS	537 modified		none		2	125-ml	poly	Yes			
VOCs	SW-846 8260B		HCl		3	40-ml	glass	Yes			
1,4-dioxane	SW-846 8270D SIM		none		1	1-L	glass	Yes			
OBSERVATIONS / NOTES:											
Pull tubing 2' off bottom											
Coordinates:	N	E	Signature(s):								

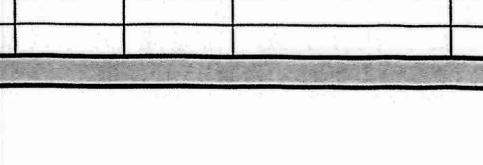
GROUNDWATER SAMPLE LOG SHEET



TETRA TECH

FT-PZ-4595-20171214 23B 12-14-17

Event: Calverton PFAS 2017
Project Site Name: NWIRP Calverton
Project No.: 112G08005-WE05

Sample ID: FC-MW021R1-20171212		Sampled By: JB BB									
QA/QC Duplicate ID: —		Sample Date: 12-14-17									
MS/MSD Collected: YES (NO)		Sample Time: 1217									
WELL INFORMATION:											
Well ID: FT-PZ-459S		Purge Date: 12-14-17									
Well Diameter (in): 2"		Static Water Level (ft-BTOR):									
Top of Screen (ft-BTOR): 7' bgs		PID Monitor Reading: 0.76									
Bottom of Screen (ft-BTOR): 17' bgs		Purge Method: Low Flow									
Total Well Depth (ft-BTOR): 7' bgs		Sample Method: Low Flow									
EQUIPMENT INFORMATION:											
Water Quality Instrument: Horiba U-52		Pump Controller: Peristaltic									
Turbidity Meter: Lamotte 2020											
PURGE DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1130	11.40	Start purge									
1135	11.42	250	clear	4.77	0.041	5.89	—	10.35	230	0.0	—
1140	11.42	250		4.69	0.040	4.40	1.60	10.60	240	0.0	—
1145				4.65	0.040	3.71	1.00	10.79	250	0.0	—
1150				4.64	0.040	3.61	0.93	10.86	251	0.0	—
1155				4.62	0.040	3.54	0.67	10.91	257	0.0	—
1200				4.62	0.040	3.55	0.62	10.93	262	0.0	—
1205				4.61	0.040	3.64	0.55	10.92	266	0.0	—
1210				4.59	0.040	3.46	0.58	10.94	269	0.0	—
1215				4.59	0.040	3.46	0.43	10.98	271	0.0	—
1217	Collect sample										
FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1130	1217	47	4.5	4.59	0.640	3.46	0.43	10.88	271	0.0	
ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS											
Analysis	Method		Preservative	Number	Vol.	Bottle Type	Collected				
PFAS	537 modified		none	2	125-ml	poly	YES				
VOCs	SW-846 8260B		—	3	40-ml	glass	NO				
1,4-dioxane	SW-846 8270D SIM		—	1	1-L	Amber glass	YES				
OBSERVATIONS / NOTES:											
Pull tubing 2' off bottom											
Coordinates:	N	E	Signature(s): 								

GROUNDWATER SAMPLE LOG SHEET



TETRA TECH

Event: Calverton PFAS 2017
 Project Site Name: NWIRP Calverton
 Project No.: 112G08005-WE05

Sample ID: FT-PZ459I-20171214				Sampled By: LD							
QA/QC Duplicate ID: No				Sample Date: 12/14/17							
MS/MSD Collected: NO				Sample Time: 12:20:00 PM							
WELL INFORMATION:											
Well ID : FT-PZ459I				Purge Date: 12/14/17							
Well Diameter (in): 1				Static Water Level (ft-BTOR): 11.68							
Top of Screen (ft-BTOR): 41				PID Monitor Reading: 0							
Bottom of Screen (ft-BTOR): 46				Purge Method: Low Flow							
Total Well Depth (ft-BTOR): 46				Sample Method: Low Flow							
EQUIPMENT INFORMATION:											
Water Quality Instrument: Horiba U-52				Pump Controller: Peristaltic							
Turbidity Meter: Lament's 2020 La motte 2020											
PURGE DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
11:34	11.68	Start purge									
11:39	11.68	250	Clear	6.42	0.182	0.00	70.50	9.53	22	0.10	
11:43	11.68	250	Clear	6.46	0.182	0.00	70.60	9.69	20	0.10	
11:49	11.68	250	Clear	6.49	0.180	0.00	42.90	9.86	17	0.10	
11:53	11.68	250	Clear	6.50	0.178	0.00	37.80	10.02	15	0.10	
11:59	11.68	250	Clear	6.51	0.176	0.00	19.90	10.18	13	0.10	
12:03	11.68	250	Clear	6.51	0.176	0.00	11.90	10.08	11	0.10	
12:09	11.68	250	Clear	6.52	0.175	0.00	8.19	10.16	9	0.10	
12:13	11.68	250	Clear	6.51	0.175	0.00	7.05	10.26	8	0.10	
12:19	11.68	250	Clear	6.52	0.174	0.00	4.44	10.36	7	0.10	
12:20	Collect sample										
FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
11:34	12:20	55	5	6.52	0.174	0.00	4.44	10.36	7	0.10	
ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS											
Analysis	Method		Preservative		Number	Vol.	Bottle Type		Collected		
PFAS	537 modified		None		2	125-mL	Poly		Yes		
VOCs	SW-846 8260B		HCl		3	40-mL	Glass		No		
1,4-dioxane	SW-846 8270D SIM		None		1	1-L	Glass Amber		Yes		
OBSERVATIONS / NOTES:											
Pull tubing 2 feet off bottom											
Split samples with county											
Coordinates:	N	E	Signature(s): <i>Lauren Denton</i>								

GROUNDWATER SAMPLE LOG SHEET


TETRA TECH

Event: Calverton PFAS 2017
 Project Site Name: NWIRP Calverton
 Project No.: 112G08005-WE05

Sample ID: FT-PZ-460I-20171204		Sample By: 1313										
QA/QC Duplicate ID: _____		Sample Date: 12-4-17										
MS/MSD Collected: YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>		Sample Time: 1121										
WELL INFORMATION:												
Well ID: FT-PZ-460I		Purge Date: 12-4-17										
Well Diameter (in): 1"		Static Water Level (ft-BTOR): 10.10										
Top of Screen (ft-BTOR): 4.5 ft		PID Monitor Reading: 0.00										
Bottom of Screen (ft-BTOR): 5.5 ft		Purge Method: Low Flow										
Total Well Depth (ft-BTOR): 50 ft		Sample Method: Low Flow										
EQUIPMENT INFORMATION:												
Water Quality Instrument: Horiba U-52		Pump Controller: Peristaltic										
Turbidity Meter: Lamotte 2020												
PURGE DATA:												
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other	
1035	10.10	Start Purge	Clear	5.72	0.533	0.00	12.40	11.32	44	0.0	—	
1040	10.25	300	Clear	5.72	0.533	0.00	10.95	11.28	55	0.0	—	
1045	10.25		Clear	5.78	0.533	0.00	6.77	11.24	51	0.0	—	
1050	10.25			5.81	0.533	0.00	5.28	11.22	48	0.0	—	
1055				5.83	0.531	0.00	3.58	11.19	46	0.0	—	
1100				5.83	0.529	0.00	2.66	11.17	45	0.0	—	
1105				5.84	0.528	0.00	1.72	11.17	44	0.0	—	
1110				5.83	0.527	0.00	1.34	11.19	43	0.0	—	
1115				5.83	0.527	0.00	1.73	11.19	41	0.0	—	
1120	↓	↓	↓	5.87	0.530	0.00	1.73	11.19				
1121	Collect Sample											
FINAL PURGE / SAMPLE DATA:												
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other	
1035	1121	46	5.0	5.87	6.530	0.60	1.73	11.19	41	0.0	—	
ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS												
Analysis	Method	Preservative		Number	Vol.	Bottle Type	Collected					
PFAS	537 modified	none		2	125-ml	poly	no					
VOCs	SW-846 8260B	HCl		3	40-ml	glass	yes					
1,4-dioxane	SW-846 8270D SIM	none		1	1-L	glass	yes					
OBSERVATIONS / NOTES:												
Pull tubing 2' off bottom Split sample w/ County												
Coordinates:		N	E	Signature(s): 								

GROUNDWATER SAMPLE LOG SHEET


TETRA TECH

Event: Calverton PFAS 2017
 Project Site Name: NWIRP Calverton
 Project No.: 112G08005-WE05

Sample ID: FT-401I-20171204		(20°)		Sampled By: LD / JB							
QA/QC Duplicate ID: FT-DUPOG-20171204				Sample Date: 12-4-17							
MS/MSD Collected: YES		NO ONLY VOCs		Sample Time: 11110							
WELL INFORMATION:											
Well ID: FT-401I		Purge Date: 12-4-17									
Well Diameter (in): 1"		Static Water Level (ft-BTOR): 19.11									
Top of Screen (ft-BTOR): 54' bgs		PID Monitor Reading: 0.00									
Bottom of Screen (ft-BTOR): 59' bgs		Purge Method: Low Flow									
Total Well Depth (ft-BTOR): 59' bgs		Sample Method: Low Flow									
EQUIPMENT INFORMATION:											
Water Quality Instrument: Horiba U-52				Pump Controller: peristaltic							
Turbidity Meter: Lamotte 2020											
PURGE DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU) *	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1036	19.11	250	clear	Start Purge		-	-	-	-	-	-
1041	19.15	250	clear	6.03	0.364	0.00	0.00	11.15	48	0.2	-
1046	1	300	clear	6.04	0.356	0.00	0.00	11.00	34	0.2	-
1051				6.04	0.360	0.00	0.00	10.96	27	0.2	-
1056				6.04	0.359	0.00	0.00	11.00	22	0.2	-
1101				6.03	0.358	0.00	0.00	10.99	17	0.2	-
1106				6.03	0.358	0.00	0.00	10.97	14	0.2	-
1111				6.03	0.357	0.00	0.00	10.96	12	0.2	-
1116	↓	↓	↓	Collect Sample							
FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1036	1116	40	3.5 gal	6.03	0.357	0.00	0.00	10.96	12	0.2	-
ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS:											
Analysis	Method			Preservative	Number	Vol.	Bottle Type	Collected			
PFAS	537 modified			none	2	125-ml	poly	no			
VOCs	SW-846 8260B			HCl	3	40-ml	glass				
1,4-dioxane	SW-846 8270D SIM			none	1	1-L	glass (anhyd.)	Y			
OBSERVATIONS / NOTES:											
Pull tubing 3' off bottom * measure turbidity w/ horiba . split samples w/ County.											
Coordinates:	N	E	Signature(s): 								

GROUNDWATER SAMPLE LOG SHEET


TETRA TECH

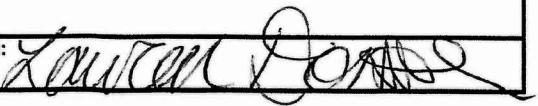
Event: Calverton PFAS 2017
 Project Site Name: NWIRP Calverton
 Project No.: 112G08005-WE05

Sample ID: FT-P24625-20171202	Sampled By: BB										
QA/QC Duplicate ID:	Sample Date: 12-2-17										
MS/MSD Collected: YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	Sample Time: 0850										
WELL INFORMATION:											
Well ID: FT-P24625	Purge Date: 12-2-17										
Well Diameter (in): 1"	Static Water Level (ft-BTOR): 5.71										
Top of Screen (ft-BTOR): 3' 6"	PID Monitor Reading: 0.00										
Bottom of Screen (ft-BTOR): 13' 6"	Purge Method: Low Flow										
Total Well Depth (ft-BTOR): 13' 6"	Sample Method: Low Flow										
EQUIPMENT INFORMATION:											
Water Quality Instrument: Horiba U-52	Pump Controller: Peristaltic										
Turbidity Meter: Lamotte 2020											
PURGE DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
0725	Start purge		Yellow								
0730	5.71	300	Yellow	3.48	0.102	0.63	10.30	7.53	185	0.0	—
0815	5.71		Yellow	3.75	0.098	0.60	3.41	8.98	169	0.0	—
0820	5.71			3.72	0.098	0.00	2.18	9.44	159	0.0	—
0825				3.77	0.097	0.00	1.96	9.72	156	0.0	—
0830				4.00	0.098	0.60	—	9.84	154	0.0	—
0835				4.01	0.098	0.60	—	9.94	153	0.0	—
0840				4.02	0.098	0.00	1.33	10.02	152	0.0	—
0845				4.04	0.098	0.00	1.80	10.17	151	0.0	—
0850				4.04	0.098	0.00	1.43	10.35	151	0.0	—
0850	collect sample										
FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
0805	0850	45	5	4.04	0.098	0.00	1.43	10.35	151	0.0	—
ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS											
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected					
PFAS	537 modified	none	2	125-ml	poly	yes					
VOCs	SW-846 8260B	HEI	3	40-ml	glass	no					
1,4-dioxane	SW-846 8270D SIM	none	1	1-L	glass	yes					
OBSERVATIONS / NOTES:											
Pull tubing 3' off bottom											
Coordinates:	N	E	Signature(s): 								

GROUNDWATER SAMPLE LOG SHEET


TETRA TECH

Event: Calverton PFAS 2017
 Project Site Name: NWIRP Calverton
 Project No.: 112G08005-WE05

Sample ID: FT-PZ462I-20171202		Sampled By: LD									
QA/QC Duplicate ID:		Sample Date: 12-2-17									
MS/MSD Collected: YES (NO)		Sample Time: 0852									
WELL INFORMATION:											
Well ID: FT-PZ462I		Purge Date: 12-02-17									
Well Diameter (in): 1"		Static Water Level (ft-BTOR): 0.21									
Top of Screen (ft-BTOR): 44		PID Monitor Reading: 0.0									
Bottom of Screen (ft-BTOR): 49		Purge Method: Low Flow									
Total Well Depth (ft-BTOR): 49		Sample Method: Low Flow									
EQUIPMENT INFORMATION:											
Water Quality Instrument: Horiba U-52		Pump Controller: peristaltic									
Turbidity Meter: Lamotte 2020											
PURGE DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
0803	0.21	200	tint tint	6.23	0.078	10.29	37.5	2.83	177	0.0	-
0808	0.24		clear	6.49	0.061	9.62	12.1	4.09	171	0.0	-
0813	0.24			6.57	0.058	10.34	0.0	4.77	170	0.0	-
0818				6.68	0.056	9.70	0.0	8.15	169	0.0	-
0823				6.76	0.052	9.59	0.0	9.10	167	0.0	-
0828				6.78	0.049	7.79	0.0	9.91	166	0.0	-
0833				6.80	0.048	7.50	3.34	10.07	166	0.0	-
0838				6.82	0.047	7.85	4.61.62	10.16	167	0.0	-
0843				6.83	0.047	7.90	2.22	10.24	167	0.0	-
0852	Collect Sample										
FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
0803	0852	49	5 gal	6.83	0.047	7.90	2.22	10.24	167	0.0	-
ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS											
Analysis	Method		Preservative	Number	Vol.	Bottle Type		Collected			
PFAS	537 modified		none	2	125-ml	poly		y			
VOCs	SW-846 8260B		HCl	3	40-ml	glass		n/o			
1,4-dioxane	SW-846 8270D SIM		none			glass		y			
OBSERVATIONS / NOTES:											
Pull tubing 2' off bottom		★ Condensation in Lamotte. use Horiba for turbidity									
Coordinates:	N		E		Signature(s): 						

GROUNDWATER SAMPLE LOG SHEET


TETRA TECH

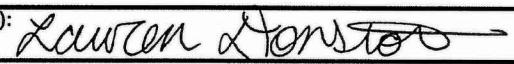
Event: Calverton PFAS 2017
 Project Site Name: NWIRP Calverton
 Project No.: 112G08005-WE05

Sample ID: FT-P2463S-20171214		Sample By: BTB									
QA/QC Duplicate ID:		Sample Date: 12/14/17									
MS/MSD Collected:	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>	Sample Time: 1357								
WELL INFORMATION:											
Well ID: FT-P2463S	Purge Date: 12/14/17										
Well Diameter (in): 1"	Static Water Level (ft-BTOR): 7.31										
Top of Screen (ft-BTOR): 2.5'	PID Monitor Reading: 0.00										
Bottom of Screen (ft-BTOR): 12.5'	Purge Method: Low Flow										
Total Well Depth (ft-BTOR): 12.5'	Sample Method: Low Flow										
EQUIPMENT INFORMATION:											
Water Quality Instrument: Horiba U-52	Pump Controller: Peristaltic										
Turbidity Meter: Lamotte 2020											
PURGE DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL/min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1315	7.31	Purge	clear	4.91	0.052	0.68	13.5	9.53	209	0.0	
1315	7.31	300	clear	4.98	0.053	0.00	13.7	9.98	195	0.0	
1320	7.31			5.02	0.054	0.00	8.00	10.27	183	0.0	
1325				5.04	0.053	0.00	4.77	10.38	178	0.0	
1330				5.06	0.053	0.00	3.16	10.40	174	0.0	
1335				5.08	0.053	0.00	2.65	10.47	170	0.0	
1340				5.11	0.053	0.00	1.47	10.33	167	0.0	
1345				5.11	0.053	0.00	1.27	10.44	167	0.0	
1350				5.11	0.053	0.00	1.27	10.44	167	0.0	
1355	V	↓	↓	—	—	—	—	—	—	—	
1357	Collect sample										
FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal./L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1315	1357	47	4.3	5.11	0.053	0.60	1.27	10.44	167	0.0	—
ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS											
Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected					
PFAS	537 modified	none	2	125-ml	poly	yes					
VOCs	SW-846 8260B	HCl	3	40-ml	glass	no					
1,4-dioxane	SW-846 8270D SIM	none	1	1-L	glass	no					
OBSERVATIONS / NOTES:											
Pull tubing off bottom											
Coordinates:	N	E	Signature(s):								

GROUNDWATER SAMPLE LOG SHEET


TETRA TECH

Event:	Calverton PFAS 2017
Project Site Name:	NWIRP Calverton
Project No.:	112G08005-WE05

Sample ID: F-PZ463I-20171214				Sampled By: LD							
QA/QC Duplicate ID: No				Sample Date: 12/14/17							
MS/MSD Collected: NO				Sample Time: 1:52:00 PM							
WELL INFORMATION:											
Well ID : FT-PZ463I				Purge Date: 12/14/17							
Well Diameter (in): 1				Static Water Level (ft-BTOR): 7.4							
Top of Screen (ft-BTOR): 43.5				PID Monitor Reading: 0							
Bottom of Screen (ft-BTOR): 53.5				Purge Method: Low Flow							
Total Well Depth (ft-BTOR): 53.5				Sample Method: Low Flow							
EQUIPMENT INFORMATION:											
Water Quality Instrument: Horiba U-52				Pump Controller: Peristaltic							
Turbidity Meter: Lamotte's 2020 Lamotte 2020											
PURGE DATA:											
Time (Hrs)	H ₂ O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
13:07	7.40	Start purge									
13:12	7.43	250	Clear	5.89	0.067	0.00	20.50	9.98	43	0.00	
13:17	7.43	250	Clear	tubing slipped							
13:22	7.43	250	Clear	5.80	0.064	0.00	12.20	10.02	36	0.00	
13:27	7.43	250	Clear	5.75	0.064	0.00	6.73	10.09	35	0.00	
13:32	7.43	250	Clear	5.75	0.063	0.00	4.99	10.14	34	0.00	
13:37	7.43	250	Clear	5.74	0.063	0.00	3.23	10.12	32	0.00	
13:42	7.43	250	Clear	5.74	0.063	0.00	2.63	10.11	30	0.00	
13:47	7.43	250	Clear	5.74	0.063	0.00	2.62	10.13	30	0.00	
13:52	Collect sample										
FINAL PURGE / SAMPLE DATA:											
Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
13:07	13:52	45	5	5.74	0.063	0.00	2.62	10.13	30	0.00	
ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS											
Analysis	Method		Preservative		Number	Vol.	Bottle Type		Collected		
PFAS	537 modified		None		2	125-mL	Poly		Yes		
VOCs	SW-846 8260B		HCl		3	40-mL	Glass		No		
1,4-dioxane	SW-846 8270D SIM		None		1	1-L	Glass Amber		No		
OBSERVATIONS / NOTES:											
Pull tubing 2 feet off bottom											
Coordinates:	N		E		Signature(s): 						

GROUNDWATER SAMPLE LOG SHEET



TETRA TECH

Event: Calverton PFAS 2017
Project Site Name: NWIRP Calverton
Project No.: 112G08005-WE05

Sample ID: CV-FLTS-COMBINF-20171213	Sampled By: J.Birkett
QA/QC Duplicate ID: CV-Dup09-20171213 &900	Sample Date: 12-13-17
MS/MSD Collected: <input checked="" type="radio"/> YES <input type="radio"/> NO	Sample Time: 0810
ADDITIONAL INFORMATION	

WELL INFORMATION:

Well ID : Calv FLTS Influent (EW1 and EW3)	Purge Date: 12-13-17
Well Diameter (in): —	Static Water Level (ft-BTOR): —
Top of Screen (ft-BTOR): —	PID Monitor Reading: 0.0
Bottom of Screen (ft-BTOR): —	Purge Method: Low Flow
Total Well Depth (ft-BTOR): —	Sample Method: Low Flow

EQUIPMENT INFORMATION:

Water Quality Instrument: Horiba U-52 **Pump Controller:** Extraction System
Turbidity Meter: Lamotte 2020

PURGE DATA:

FINAL PURGE / SAMPLE DATA:

Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
0801	0810	9	4.91	5.55	0.141	0.90	0.0	13.75	156	0.1	-

ANALYSIS, PRESERVATION AND BOTTLE REQUIREMENTS

Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
PFAS	537 modified	none	26	125-ml	poly	yes
VOCs	SW-846 8260B	—	3	40-ml	glass	No
1,4-dioxane	SW-846 8270D SIM	—	—	—	glass	No

OBSERVATIONS / NOTES:

Pull tubing off bottom

Coordinates:	N	E	Signature(s): 
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APPENDIX B
2017 DATA VALIDATION LETTERS AND LABORATORY RESULTS

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TETRA TECH

INTERNAL CORRESPONDENCE

TO: K. FRANCISCO **DATE:** APRIL 3, 2018
FROM: J.SAMCHUCK **COPIES:** DV FILE/REV.
SUBJECT: ORGANIC DATA VALIDATION – VOC / 1,4-DIOXANE
NWIRP CALVERTON – FULL REVIEW
SAMPLE DELIVERY GROUP (SDG) I6740
SAMPLES: 6 / Water / VOC /

FT-PZ-461I-20171204 FT-DUP06-20171204 FT-PZ-456I-20171204
FT-PZ-456S-20171204 FT-PZ-460I-20171204 FT-TB02-20171204

11 / Water / 1,4-Dioxane

FT-DUP06-20171204 FT-PZ-453S-20171202 FT-PZ-455I-20171202
FT-PZ-455S-20171202 FT-PZ-456I-20171204 FT-PZ-456S-20171204
FT-PZ-457S-20171204 FT-PZ-460I-20171204 FT-PZ-461I-20171204
FT-PZ-462I-20171202 FT-PZ-462S-20171202

OVERVIEW

The sample set for NWIRP Calverton, SDG I6740, consists of eleven (11) water environmental samples and one (1) trip blank. One field duplicate pair (FT-DUP06-20171204/FT-PZ-4611-20171204) was included in this SDG

Samples were analyzed for volatile organic compounds (VOCs) and 1,4-dioxane. The samples were collected by Tetra Tech on December 4, 2017 and analyzed by ChemTech. All analyses were conducted in accordance with SW-864 Methods 8260C (for VOCs) and 8270D (for 1,4-dioxane) analysis and reporting protocols. The data contained in this SDG were validated with regard to the following parameters:

- Data Completeness
 - Holding Times
 - GC/MS Tuning
 - Initial/Continuing Calibrations
 - Laboratory Method Blank Results
 - Surrogate Recoveries
 - Laboratory Control Sample Results
 - Matrix Spike/Matrix Spike Duplicate Results
 - Internal Standards
 - Compound Quantitation
 - Compound Identification
 - Detection Limits

The asterisk (*) indicates that all quality control criteria were met for this parameter. Qualified (if applicable) analytical results are summarized in Appendix A. Results as reported by the laboratory are presented in Appendix B. Appendix C contains the documentation to support the findings as discussed in this data validation report.

SURROGATE RECOVERIES

In the 1,4-dioxane analysis, surrogate %Rs were outside (above) of the laboratory acceptance limits as follows:

Sample	Noncompliance(s)	Action
FT-PZ-462I-20171202	High %Rs	NA*
FT-PZ-455S-20171202	High %Rs	NA*
FT-PZ-455I-20171202	High %R	NA*
FT-PZ-453S-20171202	High %R	NA*
FT-PZ-456I-20171204	High %R	J
FT-PZ-456S-20171204	High %R	NA*
FT-PZ-461I-20171204	High %R	J+
FT-DUP06-20171204	High %R	J+
FT-PZ-460I-20171204	High %R	NA*
FT-PZ-460I-20171204-DL	High %R	J+
FT-PZ-457S-20171204	High %R	NA*

NA* - No action

Detected results for 1,4-dioxane were qualified as estimated (J) or (J+) when a bias could be determined. No action necessary for samples containing non-detected results.

UNCERTAINTY NEAR THE DETECTION LIMIT

Positive results reported between the detection limit (DL) and the limit of quantitation (LOQ) were qualified as estimated (J) due to uncertainty near the DL.

ADDITIONAL COMMENTS

Non-detected results were reported to the limit of detection (LOD).

Additional samples are listed on the chain of custody but are not included in this SDG. These additional samples are included in SDG I6698.

1,3,5-Trichlorobenzene was not detected as a tentatively identified compound in any sample.

The VOC initial calibration performed on 11/30/17 on instrument MSVOA_N had relative standard deviations (RSDs) that were greater than the 15% quality control limit for cyclohexane, 1,1,2,2-tetrachloroethane, 1,2,4-trichlorobenzene, naphthalene, and 1,2,3-trichlorobenzene. However, as stated in the laboratory case narrative report, these compounds were compliant with either linear or quadratic regression. The raw data forms indicate that these compounds are compliant and are included in Appendix C of this validation report.

The VOC opening continuing calibration performed on 12/06/17 at 10:06 on instrument MSVOA_N had a percent difference (%D) that was greater than the 20% quality control limit for cyclohexane. However, the laboratory case narrative report states that the %D calculated based on the % drift was < 20%. The raw data form using amount added and calculated amount has been added to Appendix C of this report and indicates that the %D for cyclohexane is compliant in the opening continuing calibration as calculated on this form.

EXECUTIVE SUMMARY

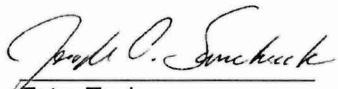
Laboratory Performance Issues: High surrogate recoveries were noted in all 8270D samples except FT-PZ-sample 462S-20171202.

TO: K. FRANCISCO
DATE: 04/3/18

PAGE 3
SDG I6740

Other Factors Affecting Data Quality: Detected results between the DL and the LOQ were qualified as estimated.

The data for these analyses were reviewed with reference to the US EPA Region 2 SOP No. HW-24 Revision 4 Validating Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry SW-846/8260C, SOP No. HW-22 Revision 5 Validating Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry SW-846/8270D, the US EPA National Functional Guidelines for Organic Data Review (January 2017), and the Department of Defense (DoD) document entitled "Quality Systems Manual (QSM) for Environmental Laboratories 5.0" (2013). The text of this report has been formulated to address only those problem areas affecting data quality.



Tetra Tech

Joseph A. Samchuck
Data Validation Manager

Attachments:

- Appendix A – Qualified Analytical Results
- Appendix B – Results as Reported by the Laboratory
- Appendix C – Support Documentation

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APPENDIX A
QUALIFIED ANALYTICAL RESULTS

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PROJ_NO: 08005-WE05	NSAMPLE	FT-DUP06-20171204		FT-PZ-456I-20171204		FT-PZ-456S-20171204		FT-PZ-460I-20171204	
SDG: I6740	LAB_ID	I6740-11		I6740-06		I6740-07		I6740-12	
FRACTION: OV	SAMP_DATE	12/4/2017		12/4/2017		12/4/2017		12/4/2017	
MEDIA: WATER	QC_TYPE	NM		NM		NM		NM	
	UNITS	UG/L		UG/L		UG/L		UG/L	
	PCT_SOLIDS	0.0		0.0		0.0		0.0	
	DUP_OF	FT-PZ-461I-20171204							
PARAMETER	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
1,1,1-TRICHLOROETHANE	0.75	U		0.75	U		0.75	U	
1,1,2,2-TETRACHLOROETHANE	0.5	U		0.5	U		0.5	U	
1,1,2-TRICHLOROETHANE	0.5	U		0.5	U		0.5	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	0.5	U		0.5	U		0.5	U	
1,1-DICHLOROETHANE	0.93	J	P	0.5	U		0.5	U	23.2
1,1-DICHLOROETHENE	0.82	J	P	0.5	U		0.5	U	60.4
1,2,3-TRICHLOROBENZENE	0.5	U		0.5	U		0.5	U	
1,2,4-TRICHLOROBENZENE	0.5	U		0.5	U		0.5	U	
1,2-DIBROMO-3-CHLOROPROPANE	2	U		2	U		2	U	
1,2-DIBROMOETHANE	0.5	U		0.5	U		0.5	U	
1,2-DICHLOROBENZENE	0.5	U		0.5	U		0.5	U	
1,2-DICHLOROETHANE	0.75	U		0.75	U		0.75	U	
1,2-DICHLOROPROPANE	0.5	U		0.5	U		0.5	U	
1,3-DICHLOROBENZENE	0.5	U		0.5	U		0.5	U	
1,4-DICHLOROBENZENE	0.5	U		0.5	U		0.5	U	
2-BUTANONE	2.5	U		2.5	U		2.5	U	
2-HEXANONE	3.8	U		3.8	U		3.8	U	
4-METHYL-2-PENTANONE	2.5	U		2.5	U		2.5	U	
ACETONE	2.5	U		2.5	U		2.5	U	
BENZENE	0.5	U		0.5	U		0.5	U	
BROMODICHLOROMETHANE	0.5	U		0.5	U		0.5	U	
BROMOFORM	0.5	U		0.5	U		0.5	U	
BROMOMETHANE	0.5	U		0.5	U		0.5	U	
CARBON DISULFIDE	0.5	U		0.5	U		0.5	U	
CARBON TETRACHLORIDE	0.5	U		0.5	U		0.5	U	
CHLOROBENZENE	0.5	U		0.5	U		0.5	U	
CHLORODIBROMOMETHANE	0.5	U		0.5	U		0.5	U	
CHLOROETHANE	0.5	U		0.5	U		0.5	U	
CHLOROFORM	0.5	U		0.5	U		0.5	U	
CHLOROMETHANE	0.5	U		0.5	U		0.5	U	
CIS-1,2-DICHLOROETHENE	1.6	J	P	0.5	U		0.5	U	3.2 J P
CIS-1,3-DICHLOROPROPENE	0.5	U		0.5	U		0.5	U	
CYCLOHEXANE	0.5	U		0.5	U		0.5	U	
DICHLORODIFLUOROMETHANE	0.5	U		0.5	U		0.5	U	
ETHYLBENZENE	0.5	U		0.5	U		0.5	U	

PROJ_NO: 08005-WE05	NSAMPLE	FT-PZ-461I-20171204		FT-TB02-20171204		
SDG: I6740	LAB_ID	I6740-08			I6740-14	
FRACTION: OV	SAMP_DATE	12/4/2017			12/4/2017	
MEDIA: WATER	QC_TYPE	NM			NM	
	UNITS	UG/L			UG/L	
	PCT_SOLIDS	0.0			0.0	
	DUP_OF					
PARAMETER	RESULT	VQL	QLCD	RESULT	VQL	QLCD
1,1,1-TRICHLOROETHANE	0.75	U		0.75	U	
1,1,2,2-TETRACHLOROETHANE	0.5	U		0.5	U	
1,1,2-TRICHLOROETHANE	0.5	U		0.5	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	0.5	U		0.5	U	
1,1-DICHLOROETHANE	0.96	J	P	0.5	U	
1,1-DICHLOROETHENE	0.82	J	P	0.5	U	
1,2,3-TRICHLOROBENZENE	0.5	U		0.5	U	
1,2,4-TRICHLOROBENZENE	0.5	U		0.5	U	
1,2-DIBROMO-3-CHLOROPROPANE	2	U		2	U	
1,2-DIBROMOETHANE	0.5	U		0.5	U	
1,2-DICHLOROBENZENE	0.5	U		0.5	U	
1,2-DICHLOROETHANE	0.75	U		0.75	U	
1,2-DICHLOROPROPANE	0.5	U		0.5	U	
1,3-DICHLOROBENZENE	0.5	U		0.5	U	
1,4-DICHLOROBENZENE	0.5	U		0.5	U	
2-BUTANONE	2.5	U		2.5	U	
2-HEXANONE	3.8	U		3.8	U	
4-METHYL-2-PENTANONE	2.5	U		2.5	U	
ACETONE	2.5	U		2.5	U	
BENZENE	0.5	U		0.5	U	
BROMODICHLOROMETHANE	0.5	U		0.5	U	
BROMOFORM	0.5	U		0.5	U	
BROMOMETHANE	0.5	U		0.5	U	
CARBON DISULFIDE	0.5	U		0.5	U	
CARBON TETRACHLORIDE	0.5	U		0.5	U	
CHLOROBENZENE	0.5	U		0.5	U	
CHLORODIBROMOMETHANE	0.5	U		0.5	U	
CHLOROETHANE	0.5	U		0.5	U	
CHLOROFORM	0.5	U		0.5	U	
CHLOROMETHANE	0.5	U		0.5	U	
CIS-1,2-DICHLOROETHENE	1.6	J	P	0.5	U	
CIS-1,3-DICHLOROPROPENE	0.5	U		0.5	U	
CYCLOHEXANE	0.5	U		0.5	U	
DICHLORODIFLUOROMETHANE	0.5	U		0.5	U	
ETHYLBENZENE	0.5	U		0.5	U	

PROJ_NO: 08005-WE05	NSAMPLE	FT-DUP06-20171204	FT-PZ-456I-20171204	FT-PZ-456S-20171204	FT-PZ-460I-20171204							
SDG: I6740	LAB_ID	I6740-11	I6740-06	I6740-07	I6740-12							
FRACTION: OV	SAMP_DATE	12/4/2017	12/4/2017	12/4/2017	12/4/2017							
MEDIA: WATER	QC_TYPE	NM	NM	NM	NM							
	UNITS	UG/L	UG/L	UG/L	UG/L							
	PCT_SOLIDS	0.0	0.0	0.0	0.0							
	DUP_OF	FT-PZ-461I-20171204										
PARAMETER	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
ISOPROPYLBENZENE	0.5	U		0.5	U		0.5	U		0.5	U	
M+P-XYLENES	1	U		1	U		1	U		1	U	
METHYL ACETATE	2	U		2	U		2	U		2	U	
METHYL CYCLOHEXANE	0.5	U		0.5	U		0.5	U		0.5	U	
METHYL TERT-BUTYL ETHER	0.5	U		0.5	U		0.5	U		0.5	U	
METHYLENE CHLORIDE	0.5	U		0.5	U		0.5	U		0.5	U	
NAPHTHALENE	0.5	U		0.5	U		0.5	U		0.5	U	
O-XYLENE	0.5	U		0.5	U		0.5	U		0.5	U	
STYRENE	0.5	U		0.5	U		0.5	U		0.5	U	
TETRACHLOROETHENE	0.47	J	P	0.5	U		0.5	U		2.9	J	P
TOLUENE	0.5	U		0.5	U		0.5	U		0.5	U	
TOTAL XYLEMES	1.5	U		1.5	U		1.5	U		1.5	U	
TRANS-1,2-DICHLOROETHENE	0.5	U		0.5	U		0.5	U		0.5	U	
TRANS-1,3-DICHLOROPROPENE	0.5	U		0.5	U		0.5	U		0.5	U	
TRICHLOROETHENE	20.6			0.5	J	P	0.5	U		100		
TRICHLOROFLUOROMETHANE	0.5	U		0.5	U		0.5	U		0.5	U	
VINYL CHLORIDE	0.5	U		0.5	U		0.5	U		0.5	U	

PROJ_NO: 08005-WE05	NSAMPLE	FT-PZ-461I-20171204		FT-TB02-20171204		
SDG: I6740	LAB_ID	I6740-08		I6740-14		
FRACTION: OV	SAMP_DATE	12/4/2017		12/4/2017		
MEDIA: WATER	QC_TYPE	NM		NM		
	UNITS	UG/L		UG/L		
	PCT_SOLIDS	0.0		0.0		
	DUP_OF					
PARAMETER	RESULT	VQL	QLCD	RESULT	VQL	QLCD
ISOPROPYLBENZENE	0.5	U		0.5	U	
M+P-XYLENES	1	U		1	U	
METHYL ACETATE	2	U		2	U	
METHYL CYCLOHEXANE	0.5	U		0.5	U	
METHYL TERT-BUTYL ETHER	0.5	U		0.5	U	
METHYLENE CHLORIDE	0.5	U		0.5	U	
NAPHTHALENE	0.5	U		0.5	U	
O-XYLENE	0.5	U		0.5	U	
STYRENE	0.5	U		0.5	U	
TETRACHLOROETHENE	0.48	J	P	0.5	U	
TOLUENE	0.5	U		0.5	U	
TOTAL XYLENES	1.5	U		1.5	U	
TRANS-1,2-DICHLOROETHENE	0.5	U		0.5	U	
TRANS-1,3-DICHLOROPROPENE	0.5	U		0.5	U	
TRICHLOROETHENE	20.5			0.5	U	
TRICHLOROFLUOROMETHANE	0.5	U		0.5	U	
VINYL CHLORIDE	0.5	U		0.5	U	

PROJ_NO: 08005-WE05	NSAMPLE	FT-DUP06-20171204		FT-PZ-453S-20171202			FT-PZ-455I-20171202			FT-PZ-455S-20171202			
SDG: I6740	LAB_ID	I6740-11		I6740-05			I6740-04			I6740-03			
FRACTION: OS	SAMP_DATE	12/4/2017		12/2/2017			12/2/2017			12/2/2017			
MEDIA: WATER	QC_TYPE	NM		NM			NM			NM			
	UNITS	UG/L		UG/L			UG/L			UG/L			
	PCT_SOLIDS	0.0		0.0			0.0			0.0			
	DUP_OF	FT-PZ-461I-20171204											
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
1,4-DIOXANE		1	J+	R	0.05	U		0.05	U		0.05	U	

PROJ_NO: 08005-WE05	NSAMPLE	FT-PZ-456I-20171204			FT-PZ-456S-20171204			FT-PZ-457S-20171204			FT-PZ-460I-20171204-DL		
SDG: I6740	LAB_ID	I6740-06			I6740-07			I6740-13			I6740-12DL		
FRACTION: OS	SAMP_DATE	12/4/2017			12/4/2017			12/4/2017			12/4/2017		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
1,4-DIOXANE		0.28	J	PR	0.05	U		0.05	U		3.2	J+	R

PROJ_NO: 08005-WE05	NSAMPLE	FT-PZ-461I-20171204		FT-PZ-462I-20171202		FT-PZ-462S-20171202	
SDG: I6740	LAB_ID	I6740-08		I6740-02		I6740-01	
FRACTION: OS	SAMP_DATE	12/4/2017		12/2/2017		12/2/2017	
MEDIA: WATER	QC_TYPE	NM		NM		NM	
	UNITS	UG/L		UG/L		UG/L	
	PCT_SOLIDS	0.0		0.0		0.0	
	DUP_OF						
PARAMETER	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT
1,4-DIOXANE	1	J+	R	0.05	U		0.05
							U



RESULTS AS REPORTED BY THE LABORATORY

APPENDIX B

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Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	12/04/17
Project:	CTO WE05 NWIRP Calverton, NY	Date Received:	12/05/17
Client Sample ID:	FT-PZ-456I-20171204	SDG No.:	I6740
Lab Sample ID:	I6740-06	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5	Units: mL	Final Vol: 5000 uL
Soil Aliquot Vol:		uL	Test: VOCMS Group1
GC Column:	RXI-624	ID : 0.25	Level : LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN045518.D	1		12/06/17 15:45	VN120617

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
75-71-8	Dichlorodifluoromethane	0.5	U	0.2	0.5	5	ug/L
74-87-3	Chloromethane	0.5	U	0.2	0.5	5	ug/L
75-01-4	Vinyl Chloride	0.5	U	0.34	0.5	5	ug/L
74-83-9	Bromomethane	0.5	U	0.2	0.5	5	ug/L
75-00-3	Chloroethane	0.5	U	0.2	0.5	5	ug/L
75-69-4	Trichlorofluoromethane	0.5	U	0.35	0.5	5	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.5	U	0.45	0.5	5	ug/L
75-35-4	1,1-Dichloroethene	0.5	U	0.47	0.5	5	ug/L
67-64-1	Acetone	2.5	U	0.5	2.5	25	ug/L
75-15-0	Carbon Disulfide	0.5	U	0.2	0.5	5	ug/L
1634-04-4	Methyl tert-butyl Ether	0.5	U	0.35	0.5	5	ug/L
79-20-9	Methyl Acetate	2	U	0.2	2	5	ug/L
75-09-2	Methylene Chloride	0.5	U	0.41	0.5	5	ug/L
156-60-5	trans-1,2-Dichloroethene	0.5	U	0.41	0.5	5	ug/L
75-34-3	1,1-Dichloroethane	0.5	U	0.36	0.5	5	ug/L
110-82-7	Cyclohexane	0.5	U	0.2	0.5	5	ug/L
78-93-3	2-Butanone	2.5	U	1.3	2.5	25	ug/L
56-23-5	Carbon Tetrachloride	0.5	U	0.2	0.5	5	ug/L
156-59-2	cis-1,2-Dichloroethene	0.5	U	0.35	0.5	5	ug/L
67-66-3	Chloroform	0.5	U	0.34	0.5	5	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.4	0.75	5	ug/L
108-87-2	Methylcyclohexane	0.5	U	0.2	0.5	5	ug/L
71-43-2	Benzene	0.5	U	0.32	0.5	5	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.48	0.75	5	ug/L
79-01-6	Trichloroethene	0.5	J	0.28	0.5	5	ug/L
78-87-5	1,2-Dichloropropane	0.5	U	0.46	0.5	5	ug/L
75-27-4	Bromodichloromethane	0.5	U	0.36	0.5	5	ug/L
108-10-1	4-Methyl-2-Pentanone	2.5	U	2.1	2.5	25	ug/L
108-88-3	Toluene	0.5	U	0.37	0.5	5	ug/L
10061-02-6	t-1,3-Dichloropropene	0.5	U	0.29	0.5	5	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.5	U	0.31	0.5	5	ug/L
79-00-5	1,1,2-Trichloroethane	0.5	U	0.38	0.5	5	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.			Date Collected:	12/04/17	
Project:	CTO WE05 NWIRP Calverton, NY			Date Received:	12/05/17	
Client Sample ID:	FT-PZ-456I-20171204			SDG No.:	I6740	
Lab Sample ID:	I6740-06			Matrix:	Water	
Analytical Method:	SW8260			% Moisture:	100	
Sample Wt/Vol:	5	Units:	mL	Final Vol:	5000	uL
Soil Aliquot Vol:	uL			Test:	VOCMS Group1	
GC Column:	RXI-624	ID :	0.25	Level :	LOW	

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN045518.D	1		12/06/17 15:45	VN120617

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
591-78-6	2-Hexanone	3.8	U	1.9	3.8	25	ug/L
124-48-1	Dibromochloromethane	0.5	U	0.2	0.5	5	ug/L
106-93-4	1,2-Dibromoethane	0.5	U	0.41	0.5	5	ug/L
127-18-4	Tetrachloroethene	0.5	U	0.27	0.5	5	ug/L
108-90-7	Chlorobenzene	0.5	U	0.49	0.5	5	ug/L
100-41-4	Ethyl Benzene	0.5	U	0.2	0.5	5	ug/L
179601-23-1	m/p-Xylenes	1	U	0.95	1	10	ug/L
1330-20-7	Total Xylenes	1.5	U	1.38	1.5	15	ug/L
95-47-6	o-Xylene	0.5	U	0.43	0.5	5	ug/L
100-42-5	Styrene	0.5	U	0.36	0.5	5	ug/L
75-25-2	Bromoform	0.5	U	0.47	0.5	5	ug/L
98-82-8	Isopropylbenzene	0.5	U	0.45	0.5	5	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.5	U	0.31	0.5	5	ug/L
541-73-1	1,3-Dichlorobenzene	0.5	U	0.43	0.5	5	ug/L
106-46-7	1,4-Dichlorobenzene	0.5	U	0.32	0.5	5	ug/L
95-50-1	1,2-Dichlorobenzene	0.5	U	0.45	0.5	5	ug/L
96-12-8	1,2-Dibromo-3-Chloropropane	2	U	0.46	2	5	ug/L
120-82-1	1,2,4-Trichlorobenzene	0.5	U	0.2	0.5	5	ug/L
91-20-3	Naphthalene	0.5	U	0.2	0.5	5	ug/L
87-61-6	1,2,3-Trichlorobenzene	0.5	U	0.2	0.5	5	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	53.4		81 - 118		107%	SPK: 50
1868-53-7	Dibromofluoromethane	48.4		80 - 119		97%	SPK: 50
2037-26-5	Toluene-d8	49.3		89 - 112		99%	SPK: 50
460-00-4	4-Bromofluorobenzene	46.3		85 - 114		93%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	720741	7.67				
540-36-3	1,4-Difluorobenzene	1229550	8.59				
3114-55-4	Chlorobenzene-d5	1079420	11.41				
3855-82-1	1,4-Dichlorobenzene-d4	342188	13.35				

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	12/04/17
Project:	CTO WE05 NWIRP Calverton, NY	Date Received:	12/05/17
Client Sample ID:	FT-PZ-456I-20171204	SDG No.:	I6740
Lab Sample ID:	I6740-06	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5	Units:	mL
Soil Aliquot Vol:		uL	
GC Column:	RXI-624	ID :	0.25
		Final Vol:	5000 uL
		Test:	VOCMS Group1
		Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN045518.D	1		12/06/17 15:45	VN120617

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
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U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
OD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
() = Laboratory InHouse Limit

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	12/04/17
Project:	CTO WE05 NWIRP Calverton, NY	Date Received:	12/05/17
Client Sample ID:	FT-PZ-456S-20171204	SDG No.:	I6740
Lab Sample ID:	I6740-07	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5 mL	Final Vol:	5000 uL
Soil Aliquot Vol:	uL	Test:	VOCMS Group1
GC Column:	RXI-624 ID : 0.25	Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN045519.D	1		12/06/17 16:10	VN120617

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
75-71-8	Dichlorodifluoromethane	0.5	U	0.2	0.5	5	ug/L
74-87-3	Chloromethane	0.5	U	0.2	0.5	5	ug/L
75-01-4	Vinyl Chloride	0.5	U	0.34	0.5	5	ug/L
74-83-9	Bromomethane	0.5	U	0.2	0.5	5	ug/L
75-00-3	Chloroethane	0.5	U	0.2	0.5	5	ug/L
75-69-4	Trichlorofluoromethane	0.5	U	0.35	0.5	5	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.5	U	0.45	0.5	5	ug/L
75-35-4	1,1-Dichloroethene	0.5	U	0.47	0.5	5	ug/L
67-64-1	Acetone	2.5	U	0.5	2.5	25	ug/L
75-15-0	Carbon Disulfide	0.5	U	0.2	0.5	5	ug/L
1634-04-4	Methyl tert-butyl Ether	0.5	U	0.35	0.5	5	ug/L
79-20-9	Methyl Acetate	2	U	0.2	2	5	ug/L
75-09-2	Methylene Chloride	0.5	U	0.41	0.5	5	ug/L
156-60-5	trans-1,2-Dichloroethene	0.5	U	0.41	0.5	5	ug/L
75-34-3	1,1-Dichloroethane	0.5	U	0.36	0.5	5	ug/L
110-82-7	Cyclohexane	0.5	U	0.2	0.5	5	ug/L
78-93-3	2-Butanone	2.5	U	1.3	2.5	25	ug/L
56-23-5	Carbon Tetrachloride	0.5	U	0.2	0.5	5	ug/L
156-59-2	cis-1,2-Dichloroethene	0.5	U	0.35	0.5	5	ug/L
67-66-3	Chloroform	0.5	U	0.34	0.5	5	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.4	0.75	5	ug/L
108-87-2	Methylcyclohexane	0.5	U	0.2	0.5	5	ug/L
71-43-2	Benzene	0.5	U	0.32	0.5	5	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.48	0.75	5	ug/L
79-01-6	Trichloroethene	0.5	U	0.28	0.5	5	ug/L
78-87-5	1,2-Dichloropropane	0.5	U	0.46	0.5	5	ug/L
75-27-4	Bromodichloromethane	0.5	U	0.36	0.5	5	ug/L
108-10-1	4-Methyl-2-Pentanone	2.5	U	2.1	2.5	25	ug/L
108-88-3	Toluene	0.5	U	0.37	0.5	5	ug/L
10061-02-6	t-1,3-Dichloropropene	0.5	U	0.29	0.5	5	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.5	U	0.31	0.5	5	ug/L
79-00-5	1,1,2-Trichloroethane	0.5	U	0.38	0.5	5	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	12/04/17
Project:	CTO WE05 NWIRP Calverton, NY	Date Received:	12/05/17
Client Sample ID:	FT-PZ-456S-20171204	SDG No.:	16740
Lab Sample ID:	I6740-07	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5	Units:	mL
Soil Aliquot Vol:		uL	
GC Column:	RXI-624	ID :	0.25
		Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN045519.D	1		12/06/17 16:10	VN120617

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
591-78-6	2-Hexanone	3.8	U	1.9	3.8	25	ug/L
124-48-1	Dibromochloromethane	0.5	U	0.2	0.5	5	ug/L
106-93-4	1,2-Dibromoethane	0.5	U	0.41	0.5	5	ug/L
127-18-4	Tetrachloroethene	0.5	U	0.27	0.5	5	ug/L
108-90-7	Chlorobenzene	0.5	U	0.49	0.5	5	ug/L
100-41-4	Ethyl Benzene	0.5	U	0.2	0.5	5	ug/L
179601-23-1	m/p-Xylenes	1	U	0.95	1	10	ug/L
1330-20-7	Total Xylenes	1.5	U	1.38	1.5	15	ug/L
95-47-6	o-Xylene	0.5	U	0.43	0.5	5	ug/L
100-42-5	Styrene	0.5	U	0.36	0.5	5	ug/L
75-25-2	Bromoform	0.5	U	0.47	0.5	5	ug/L
98-82-8	Isopropylbenzene	0.5	U	0.45	0.5	5	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.5	U	0.31	0.5	5	ug/L
541-73-1	1,3-Dichlorobenzene	0.5	U	0.43	0.5	5	ug/L
106-46-7	1,4-Dichlorobenzene	0.5	U	0.32	0.5	5	ug/L
95-50-1	1,2-Dichlorobenzene	0.5	U	0.45	0.5	5	ug/L
96-12-8	1,2-Dibromo-3-Chloropropane	2	U	0.46	2	5	ug/L
120-82-1	1,2,4-Trichlorobenzene	0.5	U	0.2	0.5	5	ug/L
91-20-3	Naphthalene	0.5	U	0.2	0.5	5	ug/L
87-61-6	1,2,3-Trichlorobenzene	0.5	U	0.2	0.5	5	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	54.9		81 - 118		110%	SPK: 50
1868-53-7	Dibromofluoromethane	49.2		80 - 119		98%	SPK: 50
2037-26-5	Toluene-d8	49.6		89 - 112		99%	SPK: 50
460-00-4	4-Bromofluorobenzene	45.9		85 - 114		92%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	648999	7.67				
540-36-3	1,4-Difluorobenzene	1100290	8.59				
3114-55-4	Chlorobenzene-d5	967491	11.41				
3855-82-1	1,4-Dichlorobenzene-d4	293944	13.35				

Report of Analysis

Client: Tetra Tech NUS, Inc. Date Collected: 12/04/17
Project: CTO WE05 NWIRP Calverton, NY Date Received: 12/05/17
Client Sample ID: FT-PZ-456S-20171204 SDG No.: I6740
Lab Sample ID: I6740-07 Matrix: Water
Analytical Method: SW8260 % Moisture: 100
Sample Wt/Vol: 5 Units: mL Final Vol: 5000 uL
Soil Aliquot Vol: uL Test: VOCMS Group1
GC Column: RXI-624 ID : 0.25 Level : LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN045519.D	1		12/06/17 16:10	VN120617

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
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U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
() = Laboratory InHouse Limit

Report of Analysis

Client:	Tetra Tech NUS, Inc.			Date Collected:	12/04/17	
Project:	CTO WE05 NWIRP Calverton, NY			Date Received:	12/05/17	
Client Sample ID:	FT-PZ-461I-20171204			SDG No.:	I6740	
Lab Sample ID:	I6740-08			Matrix:	Water	
Analytical Method:	SW8260			% Moisture:	100	
Sample Wt/Vol:	5	Units:	mL	Final Vol:	5000	uL
Soil Aliquot Vol:	uL			Test:	VOCMS Group1	
GC Column:	RXI-624	ID :	0.25	Level :	LOW	

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN045520.D	1		12/06/17 16:36	VN120617

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
75-71-8	Dichlorodifluoromethane	0.5	U	0.2	0.5	5	ug/L
74-87-3	Chloromethane	0.5	U	0.2	0.5	5	ug/L
75-01-4	Vinyl Chloride	0.5	U	0.34	0.5	5	ug/L
74-83-9	Bromomethane	0.5	U	0.2	0.5	5	ug/L
75-00-3	Chloroethane	0.5	U	0.2	0.5	5	ug/L
75-69-4	Trichlorofluoromethane	0.5	U	0.35	0.5	5	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.5	U	0.45	0.5	5	ug/L
75-35-4	1,1-Dichloroethene	0.82	J	0.47	0.5	5	ug/L
67-64-1	Acetone	2.5	U	0.5	2.5	25	ug/L
75-15-0	Carbon Disulfide	0.5	U	0.2	0.5	5	ug/L
1634-04-4	Methyl tert-butyl Ether	0.5	U	0.35	0.5	5	ug/L
79-20-9	Methyl Acetate	2	U	0.2	2	5	ug/L
75-09-2	Methylene Chloride	0.5	U	0.41	0.5	5	ug/L
156-60-5	trans-1,2-Dichloroethene	0.5	U	0.41	0.5	5	ug/L
75-34-3	1,1-Dichloroethane	0.96	J	0.36	0.5	5	ug/L
110-82-7	Cyclohexane	0.5	U	0.2	0.5	5	ug/L
78-93-3	2-Butanone	2.5	U	1.3	2.5	25	ug/L
56-23-5	Carbon Tetrachloride	0.5	U	0.2	0.5	5	ug/L
156-59-2	cis-1,2-Dichloroethene	1.6	J	0.35	0.5	5	ug/L
67-66-3	Chloroform	0.5	U	0.34	0.5	5	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.4	0.75	5	ug/L
108-87-2	Methylcyclohexane	0.5	U	0.2	0.5	5	ug/L
71-43-2	Benzene	0.5	U	0.32	0.5	5	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.48	0.75	5	ug/L
79-01-6	Trichloroethene	20.5		0.28	0.5	5	ug/L
78-87-5	1,2-Dichloropropane	0.5	U	0.46	0.5	5	ug/L
75-27-4	Bromodichloromethane	0.5	U	0.36	0.5	5	ug/L
108-10-1	4-Methyl-2-Pentanone	2.5	U	2.1	2.5	25	ug/L
108-88-3	Toluene	0.5	U	0.37	0.5	5	ug/L
10061-02-6	t-1,3-Dichloropropene	0.5	U	0.29	0.5	5	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.5	U	0.31	0.5	5	ug/L
79-00-5	1,1,2-Trichloroethane	0.5	U	0.38	0.5	5	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	12/04/17
Project:	CTO WE05 NWIRP Calverton, NY	Date Received:	12/05/17
Client Sample ID:	FT-PZ-461I-20171204	SDG No.:	I6740
Lab Sample ID:	I6740-08	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5	Units: mL	Final Vol: 5000 uL
Soil Aliquot Vol:		uL	Test: VOCMS Group1
GC Column:	RXI-624	ID : 0.25	Level : LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN045520.D	1		12/06/17 16:36	VN120617

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
591-78-6	2-Hexanone	3.8	U	1.9	3.8	25	ug/L
124-48-1	Dibromochloromethane	0.5	U	0.2	0.5	5	ug/L
106-93-4	1,2-Dibromoethane	0.5	U	0.41	0.5	5	ug/L
127-18-4	Tetrachloroethene	0.48	J	0.27	0.5	5	ug/L
108-90-7	Chlorobenzene	0.5	U	0.49	0.5	5	ug/L
100-41-4	Ethyl Benzene	0.5	U	0.2	0.5	5	ug/L
179601-23-1	m/p-Xylenes	1	U	0.95	1	10	ug/L
1330-20-7	Total Xylenes	1.5	U	1.38	1.5	15	ug/L
95-47-6	o-Xylene	0.5	U	0.43	0.5	5	ug/L
100-42-5	Styrene	0.5	U	0.36	0.5	5	ug/L
75-25-2	Bromoform	0.5	U	0.47	0.5	5	ug/L
98-82-8	Isopropylbenzene	0.5	U	0.45	0.5	5	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.5	U	0.31	0.5	5	ug/L
541-73-1	1,3-Dichlorobenzene	0.5	U	0.43	0.5	5	ug/L
106-46-7	1,4-Dichlorobenzene	0.5	U	0.32	0.5	5	ug/L
95-50-1	1,2-Dichlorobenzene	0.5	U	0.45	0.5	5	ug/L
96-12-8	1,2-Dibromo-3-Chloropropane	2	U	0.46	2	5	ug/L
120-82-1	1,2,4-Trichlorobenzene	0.5	U	0.2	0.5	5	ug/L
91-20-3	Naphthalene	0.5	U	0.2	0.5	5	ug/L
87-61-6	1,2,3-Trichlorobenzene	0.5	U	0.2	0.5	5	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	53		81 - 118		106%	SPK: 50
1868-53-7	Dibromofluoromethane	49.3		80 - 119		99%	SPK: 50
2037-26-5	Toluene-d8	49.7		89 - 112		99%	SPK: 50
460-00-4	4-Bromofluorobenzene	45.2		85 - 114		90%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	719829	7.67				
540-36-3	1,4-Difluorobenzene	1208310	8.59				
3114-55-4	Chlorobenzene-d5	1065890	11.41				
3855-82-1	1,4-Dichlorobenzene-d4	325250	13.35				

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	12/04/17
Project:	CTO WE05 NWIRP Calverton, NY	Date Received:	12/05/17
Client Sample ID:	FT-PZ-461I-20171204	SDG No.:	I6740
Lab Sample ID:	I6740-08	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5	Units:	mL
Soil Aliquot Vol:			uL
GC Column:	RXI-624	ID :	0.25
			Level : LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN045520.D	1		12/06/17 16:36	VN120617

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
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U = Not Detected
 LOQ = Limit of Quantitation
 MDL = Method Detection Limit
 OD = Limit of Detection
 E = Value Exceeds Calibration Range
 Q = indicates LCS control criteria did not meet requirements
 M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value
 B = Analyte Found in Associated Method Blank
 N = Presumptive Evidence of a Compound
 * = Values outside of QC limits
 D = Dilution
 () = Laboratory InHouse Limit

Report of Analysis

Client: Tetra Tech NUS, Inc. Date Collected: 12/04/17
 Project: CTO WE05 NWIRP Calverton, NY Date Received: 12/05/17
 Client Sample ID: FT-DUP06-20171204 SDG No.: I6740
 Lab Sample ID: I6740-11 Matrix: Water
 Analytical Method: SW8260 % Moisture: 100
 Sample Wt/Vol: 5 Units: mL Final Vol: 5000 uL
 Soil Aliquot Vol: uL Test: VOCMS Group1
 GC Column: RXI-624 ID : 0.25 Level : LOW

C
D
E

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN045521.D	1		12/06/17 17:01	VN120617

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
75-71-8	Dichlorodifluoromethane	0.5	U	0.2	0.5	5	ug/L
74-87-3	Chloromethane	0.5	U	0.2	0.5	5	ug/L
75-01-4	Vinyl Chloride	0.5	U	0.34	0.5	5	ug/L
74-83-9	Bromomethane	0.5	U	0.2	0.5	5	ug/L
75-00-3	Chloroethane	0.5	U	0.2	0.5	5	ug/L
75-69-4	Trichlorofluoromethane	0.5	U	0.35	0.5	5	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.5	U	0.45	0.5	5	ug/L
75-35-4	1,1-Dichloroethene	0.82	J	0.47	0.5	5	ug/L
67-64-1	Acetone	2.5	U	0.5	2.5	25	ug/L
75-15-0	Carbon Disulfide	0.5	U	0.2	0.5	5	ug/L
1634-04-4	Methyl tert-butyl Ether	0.5	U	0.35	0.5	5	ug/L
79-20-9	Methyl Acetate	2	U	0.2	2	5	ug/L
75-09-2	Methylene Chloride	0.5	U	0.41	0.5	5	ug/L
156-60-5	trans-1,2-Dichloroethene	0.5	U	0.41	0.5	5	ug/L
75-34-3	1,1-Dichloroethane	0.93	J	0.36	0.5	5	ug/L
110-82-7	Cyclohexane	0.5	U	0.2	0.5	5	ug/L
78-93-3	2-Butanone	2.5	U	1.3	2.5	25	ug/L
56-23-5	Carbon Tetrachloride	0.5	U	0.2	0.5	5	ug/L
156-59-2	cis-1,2-Dichloroethene	1.6	J	0.35	0.5	5	ug/L
67-66-3	Chloroform	0.5	U	0.34	0.5	5	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.4	0.75	5	ug/L
108-87-2	Methylcyclohexane	0.5	U	0.2	0.5	5	ug/L
71-43-2	Benzene	0.5	U	0.32	0.5	5	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.48	0.75	5	ug/L
79-01-6	Trichloroethene	20.6		0.28	0.5	5	ug/L
78-87-5	1,2-Dichloropropane	0.5	U	0.46	0.5	5	ug/L
75-27-4	Bromodichloromethane	0.5	U	0.36	0.5	5	ug/L
108-10-1	4-Methyl-2-Pentanone	2.5	U	2.1	2.5	25	ug/L
108-88-3	Toluene	0.5	U	0.37	0.5	5	ug/L
10061-02-6	t-1,3-Dichloropropene	0.5	U	0.29	0.5	5	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.5	U	0.31	0.5	5	ug/L
79-00-5	1,1,2-Trichloroethane	0.5	U	0.38	0.5	5	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	12/04/17
Project:	CTO WE05 NWIRP Calverton, NY	Date Received:	12/05/17
Client Sample ID:	FT-DUP06-20171204	SDG No.:	I6740
Lab Sample ID:	I6740-11	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5	Units: mL	Final Vol: 5000 uL
Soil Aliquot Vol:		uL	Test: VOCMS Group1
GC Column:	RXI-624	ID : 0.25	Level : LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN045521.D	1		12/06/17 17:01	VN120617

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
591-78-6	2-Hexanone	3.8	U	1.9	3.8	25	ug/L
124-48-1	Dibromochloromethane	0.5	U	0.2	0.5	5	ug/L
106-93-4	1,2-Dibromoethane	0.5	U	0.41	0.5	5	ug/L
127-18-4	Tetrachloroethene	0.47	J	0.27	0.5	5	ug/L
108-90-7	Chlorobenzene	0.5	U	0.49	0.5	5	ug/L
100-41-4	Ethyl Benzene	0.5	U	0.2	0.5	5	ug/L
179601-23-1	m/p-Xylenes	1	U	0.95	1	10	ug/L
1330-20-7	Total Xylenes	1.5	U	1.38	1.5	15	ug/L
95-47-6	o-Xylene	0.5	U	0.43	0.5	5	ug/L
100-42-5	Styrene	0.5	U	0.36	0.5	5	ug/L
75-25-2	Bromoform	0.5	U	0.47	0.5	5	ug/L
98-82-8	Isopropylbenzene	0.5	U	0.45	0.5	5	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.5	U	0.31	0.5	5	ug/L
541-73-1	1,3-Dichlorobenzene	0.5	U	0.43	0.5	5	ug/L
106-46-7	1,4-Dichlorobenzene	0.5	U	0.32	0.5	5	ug/L
95-50-1	1,2-Dichlorobenzene	0.5	U	0.45	0.5	5	ug/L
96-12-8	1,2-Dibromo-3-Chloropropane	2	U	0.46	2	5	ug/L
120-82-1	1,2,4-Trichlorobenzene	0.5	U	0.2	0.5	5	ug/L
91-20-3	Naphthalene	0.5	U	0.2	0.5	5	ug/L
87-61-6	1,2,3-Trichlorobenzene	0.5	U	0.2	0.5	5	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	51.2		81 - 118		102%	SPK: 50
1868-53-7	Dibromofluoromethane	49.3		80 - 119		99%	SPK: 50
2037-26-5	Toluene-d8	48.8		89 - 112		98%	SPK: 50
460-00-4	4-Bromofluorobenzene	43.9		85 - 114		88%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	769192	7.67				
540-36-3	1,4-Difluorobenzene	1275460	8.59				
3114-55-4	Chlorobenzene-d5	1110370	11.41				
3855-82-1	1,4-Dichlorobenzene-d4	340554	13.35				

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	12/04/17			
Project:	CTO WE05 NWIRP Calverton, NY	Date Received:	12/05/17			
Client Sample ID:	FT-DUP06-20171204	SDG No.:	I6740			
Lab Sample ID:	I6740-11	Matrix:	Water			
Analytical Method:	SW8260	% Moisture:	100			
Sample Wt/Vol:	5	Units:	mL	Final Vol:	5000	uL
Soil Aliquot Vol:			uL	Test:	VOCMS Group1	
GC Column:	RXI-624	ID :	0.25	Level :	LOW	

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN045521.D	1		12/06/17 17:01	VN120617

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
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U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	12/04/17
Project:	CTO WE05 NWIRP Calverton, NY	Date Received:	12/05/17
Client Sample ID:	FT-PZ-460I-20171204	SDG No.:	I6740
Lab Sample ID:	I6740-12	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5	Units:	mL
Soil Aliquot Vol:		uL	
GC Column:	RXI-624	ID :	0.25
		Final Vol:	5000 uL
		Test:	VOCMS Group1
		Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN045522.D	1		12/06/17 17:26	VN120617

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
75-71-8	Dichlorodifluoromethane	0.5	U	0.2	0.5	5	ug/L
74-87-3	Chloromethane	0.5	U	0.2	0.5	5	ug/L
75-01-4	Vinyl Chloride	0.5	U	0.34	0.5	5	ug/L
74-83-9	Bromomethane	0.5	U	0.2	0.5	5	ug/L
75-00-3	Chloroethane	0.5	U	0.2	0.5	5	ug/L
75-69-4	Trichlorofluoromethane	0.5	U	0.35	0.5	5	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.5	U	0.45	0.5	5	ug/L
75-35-4	1,1-Dichloroethene	60.4		0.47	0.5	5	ug/L
67-64-1	Acetone	2.5	U	0.5	2.5	25	ug/L
75-15-0	Carbon Disulfide	0.5	U	0.2	0.5	5	ug/L
1634-04-4	Methyl tert-butyl Ether	0.5	U	0.35	0.5	5	ug/L
79-20-9	Methyl Acetate	2	U	0.2	2	5	ug/L
75-09-2	Methylene Chloride	0.5	U	0.41	0.5	5	ug/L
156-60-5	trans-1,2-Dichloroethene	0.5	U	0.41	0.5	5	ug/L
75-34-3	1,1-Dichloroethane	23.2		0.36	0.5	5	ug/L
110-82-7	Cyclohexane	0.5	U	0.2	0.5	5	ug/L
78-93-3	2-Butanone	2.5	U	1.3	2.5	25	ug/L
56-23-5	Carbon Tetrachloride	0.5	U	0.2	0.5	5	ug/L
156-59-2	cis-1,2-Dichloroethene	3.2	J	0.35	0.5	5	ug/L
67-66-3	Chloroform	0.5	U	0.34	0.5	5	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.4	0.75	5	ug/L
108-87-2	Methylcyclohexane	0.5	U	0.2	0.5	5	ug/L
71-43-2	Benzene	0.5	U	0.32	0.5	5	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.48	0.75	5	ug/L
79-01-6	Trichloroethene	100		0.28	0.5	5	ug/L
78-87-5	1,2-Dichloropropane	0.5	U	0.46	0.5	5	ug/L
75-27-4	Bromodichloromethane	0.5	U	0.36	0.5	5	ug/L
108-10-1	4-Methyl-2-Pentanone	2.5	U	2.1	2.5	25	ug/L
108-88-3	Toluene	0.5	U	0.37	0.5	5	ug/L
10061-02-6	t-1,3-Dichloropropene	0.5	U	0.29	0.5	5	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.5	U	0.31	0.5	5	ug/L
79-00-5	1,1,2-Trichloroethane	0.5	U	0.38	0.5	5	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	12/04/17
Project:	CTO WE05 NWIRP Calverton, NY	Date Received:	12/05/17
Client Sample ID:	FT-PZ-460I-20171204	SDG No.:	I6740
Lab Sample ID:	I6740-12	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5	Units: mL	Final Vol: 5000 uL
Soil Aliquot Vol:		uL	Test: VOCMS Group1
GC Column:	RXI-624	ID : 0.25	Level : LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN045522.D	1		12/06/17 17:26	VN120617

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
591-78-6	2-Hexanone	3.8	U	1.9	3.8	25	ug/L
124-48-1	Dibromochloromethane	0.5	U	0.2	0.5	5	ug/L
106-93-4	1,2-Dibromoethane	0.5	U	0.41	0.5	5	ug/L
127-18-4	Tetrachloroethene	2.9	J	0.27	0.5	5	ug/L
108-90-7	Chlorobenzene	0.5	U	0.49	0.5	5	ug/L
100-41-4	Ethyl Benzene	0.5	U	0.2	0.5	5	ug/L
179601-23-1	m/p-Xylenes	1	U	0.95	1	10	ug/L
1330-20-7	Total Xylenes	1.5	U	1.38	1.5	15	ug/L
95-47-6	o-Xylene	0.5	U	0.43	0.5	5	ug/L
100-42-5	Styrene	0.5	U	0.36	0.5	5	ug/L
75-25-2	Bromoform	0.5	U	0.47	0.5	5	ug/L
98-82-8	Isopropylbenzene	0.5	U	0.45	0.5	5	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.5	U	0.31	0.5	5	ug/L
541-73-1	1,3-Dichlorobenzene	0.5	U	0.43	0.5	5	ug/L
106-46-7	1,4-Dichlorobenzene	0.5	U	0.32	0.5	5	ug/L
95-50-1	1,2-Dichlorobenzene	0.5	U	0.45	0.5	5	ug/L
96-12-8	1,2-Dibromo-3-Chloropropane	2	U	0.46	2	5	ug/L
120-82-1	1,2,4-Trichlorobenzene	0.5	U	0.2	0.5	5	ug/L
91-20-3	Naphthalene	0.5	U	0.2	0.5	5	ug/L
87-61-6	1,2,3-Trichlorobenzene	0.5	U	0.2	0.5	5	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	52.9		81 - 118		106%	SPK: 50
1868-53-7	Dibromofluoromethane	49.4		80 - 119		99%	SPK: 50
2037-26-5	Toluene-d8	49.5		89 - 112		99%	SPK: 50
460-00-4	4-Bromofluorobenzene	44.4		85 - 114		89%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	700237	7.67				
540-36-3	1,4-Difluorobenzene	1165040	8.59				
3114-55-4	Chlorobenzene-d5	1013840	11.41				
3855-82-1	1,4-Dichlorobenzene-d4	306212	13.35				

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	12/04/17
Project:	CTO WE05 NWIRP Calverton, NY	Date Received:	12/05/17
Client Sample ID:	FT-PZ-460I-20171204	SDG No.:	I6740
Lab Sample ID:	I6740-12	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5	Units:	mL
Soil Aliquot Vol:		uL	
GC Column:	RXI-624	ID :	0.25
		Final Vol:	5000 uL
		Test:	VOCMS Group1
		Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN045522.D	1		12/06/17 17:26	VN120617

CAS Number	Parameter	Cone.	Qualifier	MDL	LOD	LOQ / CRQL	Units
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U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
.OD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
() = Laboratory InHouse Limit

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	12/04/17
Project:	CTO WE05 NWIRP Calverton, NY	Date Received:	12/05/17
Client Sample ID:	FT-TB02-20171204	SDG No.:	I6740
Lab Sample ID:	I6740-14	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5	Units:	mL
Soil Aliquot Vol:		uL	
GC Column:	RXI-624	ID :	0.25
		Level :	LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN045515.D	1		12/06/17 14:29	VN120617

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
75-71-8	Dichlorodifluoromethane	0.5	U	0.2	0.5	5	ug/L
74-87-3	Chloromethane	0.5	U	0.2	0.5	5	ug/L
75-01-4	Vinyl Chloride	0.5	U	0.34	0.5	5	ug/L
74-83-9	Bromomethane	0.5	U	0.2	0.5	5	ug/L
75-00-3	Chloroethane	0.5	U	0.2	0.5	5	ug/L
75-69-4	Trichlorofluoromethane	0.5	U	0.35	0.5	5	ug/L
76-13-1	1,1,2-Trichlorotrifluoroethane	0.5	U	0.45	0.5	5	ug/L
75-35-4	1,1-Dichloroethene	0.5	U	0.47	0.5	5	ug/L
67-64-1	Acetone	2.5	U	0.5	2.5	25	ug/L
75-15-0	Carbon Disulfide	0.5	U	0.2	0.5	5	ug/L
1634-04-4	Methyl tert-butyl Ether	0.5	U	0.35	0.5	5	ug/L
79-20-9	Methyl Acetate	2	U	0.2	2	5	ug/L
75-09-2	Methylene Chloride	0.5	U	0.41	0.5	5	ug/L
156-60-5	trans-1,2-Dichloroethene	0.5	U	0.41	0.5	5	ug/L
75-34-3	1,1-Dichloroethane	0.5	U	0.36	0.5	5	ug/L
110-82-7	Cyclohexane	0.5	U	0.2	0.5	5	ug/L
78-93-3	2-Butanone	2.5	U	1.3	2.5	25	ug/L
56-23-5	Carbon Tetrachloride	0.5	U	0.2	0.5	5	ug/L
156-59-2	cis-1,2-Dichloroethene	0.5	U	0.35	0.5	5	ug/L
67-66-3	Chloroform	0.5	U	0.34	0.5	5	ug/L
71-55-6	1,1,1-Trichloroethane	0.75	U	0.4	0.75	5	ug/L
108-87-2	Methylcyclohexane	0.5	U	0.2	0.5	5	ug/L
71-43-2	Benzene	0.5	U	0.32	0.5	5	ug/L
107-06-2	1,2-Dichloroethane	0.75	U	0.48	0.75	5	ug/L
79-01-6	Trichloroethene	0.5	U	0.28	0.5	5	ug/L
78-87-5	1,2-Dichloropropane	0.5	U	0.46	0.5	5	ug/L
75-27-4	Bromodichloromethane	0.5	U	0.36	0.5	5	ug/L
108-10-1	4-Methyl-2-Pentanone	2.5	U	2.1	2.5	25	ug/L
108-88-3	Toluene	0.5	U	0.37	0.5	5	ug/L
10061-02-6	t-1,3-Dichloropropene	0.5	U	0.29	0.5	5	ug/L
10061-01-5	cis-1,3-Dichloropropene	0.5	U	0.31	0.5	5	ug/L
79-00-5	1,1,2-Trichloroethane	0.5	U	0.38	0.5	5	ug/L

Report of Analysis

Client:	Tetra Tech NUS, Inc.			Date Collected:	12/04/17	
Project:	CTO WE05 NWIRP Calverton, NY			Date Received:	12/05/17	
Client Sample ID:	FT-TB02-20171204			SDG No.:	I6740	
Lab Sample ID:	I6740-14			Matrix:	Water	
Analytical Method:	SW8260			% Moisture:	100	
Sample Wt/Vol:	5	Units:	mL	Final Vol:	5000	uL
Soil Aliquot Vol:	uL			Test:	VOCMS Group1	
GC Column:	RXI-624	ID :	0.25	Level :	LOW	

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN045515.D	1		12/06/17 14:29	VN120617

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
591-78-6	2-Hexanone	3.8	U	1.9	3.8	25	ug/L
124-48-1	Dibromochloromethane	0.5	U	0.2	0.5	5	ug/L
106-93-4	1,2-Dibromoethane	0.5	U	0.41	0.5	5	ug/L
127-18-4	Tetrachloroethene	0.5	U	0.27	0.5	5	ug/L
108-90-7	Chlorobenzene	0.5	U	0.49	0.5	5	ug/L
100-41-4	Ethyl Benzene	0.5	U	0.2	0.5	5	ug/L
179601-23-1	m/p-Xylenes	1	U	0.95	1	10	ug/L
1330-20-7	Total Xylenes	1.5	U	1.38	1.5	15	ug/L
95-47-6	o-Xylene	0.5	U	0.43	0.5	5	ug/L
100-42-5	Styrene	0.5	U	0.36	0.5	5	ug/L
75-25-2	Bromoform	0.5	U	0.47	0.5	5	ug/L
98-82-8	Isopropylbenzene	0.5	U	0.45	0.5	5	ug/L
79-34-5	1,1,2,2-Tetrachloroethane	0.5	U	0.31	0.5	5	ug/L
541-73-1	1,3-Dichlorobenzene	0.5	U	0.43	0.5	5	ug/L
106-46-7	1,4-Dichlorobenzene	0.5	U	0.32	0.5	5	ug/L
95-50-1	1,2-Dichlorobenzene	0.5	U	0.45	0.5	5	ug/L
96-12-8	1,2-Dibromo-3-Chloropropane	2	U	0.46	2	5	ug/L
120-82-1	1,2,4-Trichlorobenzene	0.5	U	0.2	0.5	5	ug/L
91-20-3	Naphthalene	0.5	U	0.2	0.5	5	ug/L
87-61-6	1,2,3-Trichlorobenzene	0.5	U	0.2	0.5	5	ug/L
SURROGATES							
17060-07-0	1,2-Dichloroethane-d4	54.8		81 - 118		110%	SPK: 50
1868-53-7	Dibromofluoromethane	50.5		80 - 119		101%	SPK: 50
2037-26-5	Toluene-d8	49.7		89 - 112		99%	SPK: 50
460-00-4	4-Bromofluorobenzene	43		85 - 114		86%	SPK: 50
INTERNAL STANDARDS							
363-72-4	Pentafluorobenzene	536500	7.67				
540-36-3	1,4-Difluorobenzene	917643	8.59				
3114-55-4	Chlorobenzene-d5	815614	11.41				
3855-82-1	1,4-Dichlorobenzene-d4	229338	13.35				

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	12/04/17
Project:	CTO WE05 NWIRP Calverton, NY	Date Received:	12/05/17
Client Sample ID:	FT-TB02-20171204	SDG No.:	I6740
Lab Sample ID:	I6740-14	Matrix:	Water
Analytical Method:	SW8260	% Moisture:	100
Sample Wt/Vol:	5	Units:	mL
Soil Aliquot Vol:			uL
GC Column:	RXI-624	ID :	0.25
			Level : LOW

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
VN045515.D	1		12/06/17 14:29	VN120617

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
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U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
E = Value Exceeds Calibration Range
Q = indicates LCS control criteria did not meet requirements
M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value
B = Analyte Found in Associated Method Blank
N = Presumptive Evidence of a Compound
* = Values outside of QC limits
D = Dilution
() = Laboratory InHouse Limit

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	12/02/17
Project:	CTO WE05 NWIRP Calverton, NY	Date Received:	12/05/17
Client Sample ID:	FT-PZ-462S-20171202	SDG No.:	I6740
Lab Sample ID:	I6740-01	Matrix:	Water
Analytical Method:	SW8270SIM	% Moisture:	100
Sample Wt/Vol:	1000	Units:	mL
Soil Aliquot Vol:		uL	
Extraction Type :		Decanted :	N
Injection Volume :		GPC Factor :	1.0
		GPC Cleanup :	N
		PH :	

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BE094954.D	1	12/08/17 08:23	12/08/17 18:23	PB104842

CAS Number	Parameter	Cone.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
123-91-1	1,4-Dioxane	0.05	U	0.02	0.05	0.1	ug/L
SURROGATES							
7297-45-2	2-Methylnaphthalene-d10	0.16		30 - 150		39%	SPK: 0.4
93951-69-0	Fluoranthene-d10	0.16		30 - 150		41%	SPK: 0.4
4165-60-0	Nitrobenzene-d5	0.25		55 - 111		62%	SPK: 0.4
321-60-8	2-Fluorobiphenyl	0.26		53 - 106		64%	SPK: 0.4
1718-51-0	Terphenyl-d14	0.52		58 - 132		131%	SPK: 0.4
INTERNAL STANDARDS							
3855-82-1	1,4-Dichlorobenzene-d4	7597	8.48				
1146-65-2	Naphthalene-d8	16704	11.33				
15067-26-2	Acenaphthene-d10	9954	15.08				
1517-22-2	Phenanthrene-d10	23378	17.77				
1719-03-5	Chrysene-d12	23700	21.88				
1520-96-3	Perylene-d12	20200	24.56				

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	12/02/17
Project:	CTO WE05 NWIRP Calverton, NY	Date Received:	12/05/17
Client Sample ID:	FT-PZ-462I-20171202	SDG No.:	I6740
Lab Sample ID:	I6740-02	Matrix:	Water
Analytical Method:	SW8270SIM	% Moisture:	100
Sample Wt/Vol:	1000	Units: mL	Final Vol: 1000 uL
Soil Aliquot Vol:		uL	Test: SVOC-SIMGroup1
Extraction Type :		Decanted : N	Level : LOW
Injection Volume :		GPC Factor : 1.0	GPC Cleanup : N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BE094955.D	1	12/08/17 08:23	12/08/17 18:59	PB104842

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
123-91-1	1,4-Dioxane	0.05	U	0.02	0.05	0.1	ug/L
SURROGATES							
7297-45-2	2-Methylnaphthalene-d10	0.38		30 - 150		96%	SPK: 0.4
93951-69-0	Fluoranthene-d10	0.37		30 - 150		92%	SPK: 0.4
4165-60-0	Nitrobenzene-d5	0.59	*	55 - 111		147%	SPK: 0.4
321-60-8	2-Fluorobiphenyl	0.54	*	53 - 106		136%	SPK: 0.4
1718-51-0	Terphenyl-d14	0.64	*	58 - 132		160%	SPK: 0.4
INTERNAL STANDARDS							
3855-82-1	1,4-Dichlorobenzene-d4	7173	8.48				
1146-65-2	Naphthalene-d8	15828	11.33				
15067-26-2	Acenaphthene-d10	9245	15.07				
1517-22-2	Phenanthrene-d10	22491	17.77				
1719-03-5	Chrysene-d12	22062	21.89				
1520-96-3	Perylene-d12	19146	24.56				

U = Not Detected

J = Estimated Value

LOQ = Limit of Quantitation

B = Analyte Found in Associated Method Blank

MDL = Method Detection Limit

N = Presumptive Evidence of a Compound

LOD = Limit of Detection

* = Values outside of QC limits

E = Value Exceeds Calibration Range

D = Dilution

Q = indicates LCS control criteria did not meet requirements

() = Laboratory InHouse Limit

M = MS/MSD acceptance criteria did not meet requirements

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	12/02/17
Project:	CTO WE05 NWIRP Calverton, NY	Date Received:	12/05/17
Client Sample ID:	FT-PZ-455S-20171202	SDG No.:	I6740
Lab Sample ID:	I6740-03	Matrix:	Water
Analytical Method:	SW8270SIM	% Moisture:	100
Sample Wt/Vol:	1000	Units:	mL
Soil Aliquot Vol:		uL	
Extraction Type :		Decanted :	N
Injection Volume :		GPC Factor :	1.0
		GPC Cleanup :	N
		PH :	

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BE094956.D	1	12/08/17 08:23	12/08/17 19:32	PB104842

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
123-91-1	1,4-Dioxane	0.05	U	0.02	0.05	0.1	ug/L
SURROGATES							
7297-45-2	2-Methylnaphthalene-d10	0.38		30 - 150		96%	SPK: 0.4
93951-69-0	Fluoranthene-d10	0.38		30 - 150		94%	SPK: 0.4
4165-60-0	Nitrobenzene-d5	0.57	*	55 - 111		142%	SPK: 0.4
321-60-8	2-Fluorobiphenyl	0.57	*	53 - 106		142%	SPK: 0.4
1718-51-0	Terphenyl-d14	0.69	*	58 - 132		172%	SPK: 0.4
INTERNAL STANDARDS							
3855-82-1	1,4-Dichlorobenzene-d4	7462	8.48				
1146-65-2	Naphthalene-d8	16016	11.33				
15067-26-2	Acenaphthene-d10	9024	15.07				
1517-22-2	Phenanthrene-d10	21906	17.77				
1719-03-5	Chrysene-d12	21607	21.89				
1520-96-3	Perylene-d12	18807	24.56				

U = Not Detected

J = Estimated Value

LOQ = Limit of Quantitation

B = Analyte Found in Associated Method Blank

MDL = Method Detection Limit

N = Presumptive Evidence of a Compound

LOD = Limit of Detection

* = Values outside of QC limits

E = Value Exceeds Calibration Range

D = Dilution

Q = indicates LCS control criteria did not meet requirements

() = Laboratory InHouse Limit

M = MS/MSD acceptance criteria did not meet requirements

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	12/02/17
Project:	CTO WE05 NWIRP Calverton, NY	Date Received:	12/05/17
Client Sample ID:	FT-PZ-455I-20171202	SDG No.:	I6740
Lab Sample ID:	I6740-04	Matrix:	Water
Analytical Method:	SW8270SIM	% Moisture:	100
Sample Wt/Vol:	1000	Units:	mL
Soil Aliquot Vol:		uL	
Extraction Type :		Decanted :	N
Injection Volume :		GPC Factor :	1.0
		GPC Cleanup :	N
		PH :	

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BE094957.D	1	12/08/17 08:23	12/08/17 20:08	PB104842

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
123-91-1	1,4-Dioxane	0.05	U	0.02	0.05	0.1	ug/L
SURROGATES							
7297-45-2	2-Methylnaphthalene-d10	0.36		30 - 150		90%	SPK: 0.4
93951-69-0	Fluoranthene-d10	0.35		30 - 150		88%	SPK: 0.4
4165-60-0	Nitrobenzene-d5	0.54	*	55 - 111		135%	SPK: 0.4
321-60-8	2-Fluorobiphenyl	0.62	*	53 - 106		154%	SPK: 0.4
1718-51-0	Terphenyl-d14	0.67	*	58 - 132		166%	SPK: 0.4
INTERNAL STANDARDS							
3855-82-1	1,4-Dichlorobenzene-d4	7419	8.47				
1146-65-2	Naphthalene-d8	17155	11.33				
15067-26-2	Acenaphthene-d10	9689	15.08				
1517-22-2	Phenanthrene-d10	23946	17.77				
1719-03-5	Chrysene-d12	23330	21.88				
1520-96-3	Perylene-d12	19880	24.56				

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

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M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	12/02/17
Project:	CTO WE05 NWIRP Calverton, NY	Date Received:	12/05/17
Client Sample ID:	FT-PZ-453S-20171202	SDG No.:	I6740
Lab Sample ID:	I6740-05	Matrix:	Water
Analytical Method:	SW8270SIM	% Moisture:	100
Sample Wt/Vol:	1000	Units: mL	Final Vol: 1000 uL
Soil Aliquot Vol:		uL	Test: SVOC-SIMGroup1
Extraction Type :		Decanted : N	Level : LOW
Injection Volume :		GPC Factor : 1.0	GPC Cleanup : N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BE094958.D	1	12/08/17 08:23	12/08/17 20:44	PB104842

CAS Number	Parameter	Cone.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
123-91-1	1,4-Dioxane	0.05	U	0.02	0.05	0.1	ug/L
SURROGATES							
7297-45-2	2-Methylnaphthalene-d10	0.4		30 - 150		100%	SPK: 0.4
93951-69-0	Fluoranthene-d10	0.41		30 - 150		102%	SPK: 0.4
4165-60-0	Nitrobenzene-d5	0.61	*	55 - 111		153%	SPK: 0.4
321-60-8	2-Fluorobiphenyl	0.65	*	53 - 106		163%	SPK: 0.4
1718-51-0	Terphenyl-d14	0.71	*	58 - 132		176%	SPK: 0.4
INTERNAL STANDARDS							
3855-82-1	1,4-Dichlorobenzene-d4	7103	8.47				
1146-65-2	Naphthalene-d8	16187	11.33				
15067-26-2	Acenaphthene-d10	9022	15.06				
1517-22-2	Phenanthrene-d10	21315	17.77				
1719-03-5	Chrysene-d12	21951	21.89				
1520-96-3	Perylene-d12	19368	24.57				

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

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M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

Report of Analysis

Client: Tetra Tech NUS, Inc. Date Collected: 12/04/17
 Project: CTO WE05 NWIRP Calverton, NY Date Received: 12/05/17
 Client Sample ID: FT-PZ-456I-20171204 SDG No.: I6740
 Lab Sample ID: I6740-06 Matrix: Water
 Analytical Method: SW8270SIM % Moisture: 100
 Sample Wt/Vol: 1000 Units: mL Final Vol: 1000 uL
 Soil Aliquot Vol: uL Test: SVOC-SIMGroup1
 Extraction Type : Decanted : N Level : LOW
 Injection Volume : GPC Factor : 1.0 GPC Cleanup : N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BE094959.D	1	12/08/17 08:23	12/08/17 21:19	PB104842

CAS Number	Parameter	Cone.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
123-91-1	1,4-Dioxane	0.28		0.02	0.05	0.1	ug/L
SURROGATES							
7297-45-2	2-Methylnaphthalene-d10	0.38		30 - 150		94%	SPK: 0.4
93951-69-0	Fluoranthene-d10	0.37		30 - 150		91%	SPK: 0.4
4165-60-0	Nitrobenzene-d5	0.57	*	55 - 111		142%	SPK: 0.4
321-60-8	2-Fluorobiphenyl	0.6	*	53 - 106		150%	SPK: 0.4
1718-51-0	Terphenyl-d14	0.65	*	58 - 132		162%	SPK: 0.4
INTERNAL STANDARDS							
3855-82-1	1,4-Dichlorobenzene-d4	7768	8.48				
1146-65-2	Naphthalene-d8	16677	11.33				
15067-26-2	Acenaphthene-d10	9610	15.07				
1517-22-2	Phenanthrene-d10	23426	17.79				
1719-03-5	Chrysene-d12	22696	21.89				
1520-96-3	Perylene-d12	19770	24.57				

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

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M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	12/04/17
Project:	CTO WE05 NWIRP Calverton, NY	Date Received:	12/05/17
Client Sample ID:	FT-PZ-456S-20171204	SDG No.:	I6740
Lab Sample ID:	I6740-07	Matrix:	Water
Analytical Method:	SW8270SIM	% Moisture:	100
Sample Wt/Vol:	1000	Units:	mL
Soil Aliquot Vol:		uL	
Extraction Type :		Decanted :	N
Injection Volume :		GPC Factor :	1.0
		GPC Cleanup :	N
		PH :	

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BE094972.D	1	12/08/17 08:23	12/11/17 13:18	PB104842

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
123-91-1	1,4-Dioxane	0.05	U	0.02	0.05	0.1	ug/L
SURROGATES							
7297-45-2	2-Methylnaphthalene-d10	0.39		30 - 150		97%	SPK: 0.4
93951-69-0	Fluoranthene-d10	0.38		30 - 150		94%	SPK: 0.4
4165-60-0	Nitrobenzene-d5	0.58	*	55 - 111		145%	SPK: 0.4
321-60-8	2-Fluorobiphenyl	0.66	*	53 - 106		165%	SPK: 0.4
1718-51-0	Terphenyl-d14	0.63	*	58 - 132		157%	SPK: 0.4
INTERNAL STANDARDS							
3855-82-1	1,4-Dichlorobenzene-d4	7649	8.48				
1146-65-2	Naphthalene-d8	17599	11.33				
15067-26-2	Acenaphthene-d10	9819	15.08				
1517-22-2	Phenanthrene-d10	24141	17.79				
1719-03-5	Chrysene-d12	25117	21.89				
1520-96-3	Perylene-d12	20175	24.57				

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

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M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

Report of Analysis

Client: Tetra Tech NUS, Inc. Date Collected: 12/04/17
 Project: CTO WE05 NWIRP Calverton, NY Date Received: 12/05/17
 Client Sample ID: FT-PZ-461I-20171204 SDG No.: I6740
 Lab Sample ID: I6740-08 Matrix: Water
 Analytical Method: SW8270SIM % Moisture: 100
 Sample Wt/Vol: 1000 Units: mL Final Vol: 1000 uL
 Soil Aliquot Vol: uL Test: SVOC-SIMGroup1
 Extraction Type : Decanted : N Level : LOW
 Injection Volume : GPC Factor : 1.0 GPC Cleanup : N PH :

C

D

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BE094961.D	1	12/08/17 08:23	12/08/17 22:31	PB104842

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
123-91-1	1,4-Dioxane	1		0.02	0.05	0.1	ug/L
SURROGATES							
7297-45-2	2-Methylnaphthalene-d10	0.37		30 - 150		93%	SPK: 0.4
93951-69-0	Fluoranthene-d10	0.38		30 - 150		94%	SPK: 0.4
4165-60-0	Nitrobenzene-d5	0.59	*	55 - 111		147%	SPK: 0.4
321-60-8	2-Fluorobiphenyl	0.62	*	53 - 106		155%	SPK: 0.4
1718-51-0	Terphenyl-d14	0.65	*	58 - 132		162%	SPK: 0.4
INTERNAL STANDARDS							
3855-82-1	1,4-Dichlorobenzene-d4	7862	8.49				
1146-65-2	Naphthalene-d8	18120	11.33				
15067-26-2	Acenaphthene-d10	10558	15.08				
1517-22-2	Phenanthrene-d10	25647	17.79				
1719-03-5	Chrysene-d12	25994	21.88				
1520-96-3	Perylene-d12	22470	24.57				

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	12/04/17
Project:	CTO WE05 NWIRP Calverton, NY	Date Received:	12/05/17
Client Sample ID:	FT-DUP06-20171204	SDG No.:	16740
Lab Sample ID:	I6740-11	Matrix:	Water
Analytical Method:	SW8270SIM	% Moisture:	100
Sample Wt/Vol:	1000	Units:	mL
Soil Aliquot Vol:		uL	
Extraction Type :		Decanted :	N
Injection Volume :		GPC Factor :	1.0
		GPC Cleanup :	N
		PH :	

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BE094965.D	1	12/08/17 08:23	12/09/17 01:00	PB104842

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
123-91-1	1,4-Dioxane	1		0.02	0.05	0.1	ug/L
SURROGATES							
7297-45-2	2-Methylnaphthalene-d10	0.37		30 - 150		92%	SPK: 0.4
93951-69-0	Fluoranthene-d10	0.37		30 - 150		92%	SPK: 0.4
4165-60-0	Nitrobenzene-d5	0.59	*	55 - 111		148%	SPK: 0.4
321-60-8	2-Fluorobiphenyl	0.66	*	53 - 106		164%	SPK: 0.4
1718-51-0	Terphenyl-d14	0.66	*	58 - 132		165%	SPK: 0.4
INTERNAL STANDARDS							
3855-82-1	1,4-Dichlorobenzene-d4	7615	8.48				
1146-65-2	Naphthalene-d8	16455	11.33				
15067-26-2	Acenaphthene-d10	9350	15.08				
1517-22-2	Phenanthrene-d10	23107	17.79				
1719-03-5	Chrysene-d12	22008	21.88				
1520-96-3	Perylene-d12	19043	24.56				

U = Not Detected

LOQ = Limit of Quantitation

IDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

Report of Analysis

Client: Tetra Tech NUS, Inc. Date Collected: 12/04/17
 Project: CTO WE05 NWIRP Calverton, NY Date Received: 12/05/17
 Client Sample ID: FT-PZ-460I-20171204 SDG No.: I6740
 Lab Sample ID: I6740-12 Matrix: Water
 Analytical Method: SW8270SIM % Moisture: 100
 Sample Wt/Vol: 1000 Units: mL Final Vol: 1000 uL
 Soil Aliquot Vol: uL Test: SVOC-SIMGroup1
 Extraction Type : Decanted : N Level : LOW
 Injection Volume : GPC Factor : 1.0 GPC Cleanup : N PH :

C

D

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BE094966.D	1	12/08/17 08:23	12/09/17 01:36	PB104842

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
123-91-1	1,4-Dioxane	3.7	E	0.02	0.05	0.1	ug/L
SURROGATES							
7297-45-2	2-Methylnaphthalene-d10	0.4		30 - 150		100%	SPK: 0.4
93951-69-0	Fluoranthene-d10	0.4		30 - 150		99%	SPK: 0.4
4165-60-0	Nitrobenzene-d5	0.64	*	55 - 111		159%	SPK: 0.4
321-60-8	2-Fluorobiphenyl	0.67	*	53 - 106		167%	SPK: 0.4
1718-51-0	Terphenyl-d14	0.79	*	58 - 132		198%	SPK: 0.4
INTERNAL STANDARDS							
3855-82-1	1,4-Dichlorobenzene-d4	8025	8.48				
1146-65-2	Naphthalene-d8	17170	11.33				
15067-26-2	Acenaphthene-d10	9997	15.08				
1517-22-2	Phenanthrene-d10	23943	17.77				
1719-03-5	Chrysene-d12	24553	21.89				
1520-96-3	Perylene-d12	20757	24.56				

U = Not Detected

J = Estimated Value

LOQ = Limit of Quantitation

B = Analyte Found in Associated Method Blank

MDL = Method Detection Limit

N = Presumptive Evidence of a Compound

LOD = Limit of Detection

* = Values outside of QC limits

E = Value Exceeds Calibration Range

D = Dilution

Q = indicates LCS control criteria did not meet requirements

() = Laboratory InHouse Limit

M = MS/MSD acceptance criteria did not meet requirements

Report of Analysis

Client:	Tetra Tech NUS, Inc.	Date Collected:	12/04/17
Project:	CTO WE05 NWIRP Calverton, NY	Date Received:	12/05/17
Client Sample ID:	FT-PZ-460I-20171204DL	SDG No.:	16740
Lab Sample ID:	I6740-12DL	Matrix:	Water
Analytical Method:	SW8270SIM	% Moisture:	100
Sample Wt/Vol:	1000	Units:	mL
Soil Aliquot Vol:		uL	
Extraction Type :		Decanted :	N
Injection Volume :		GPC Factor :	1.0
		GPC Cleanup :	N
		PH :	

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BE094973.D	2	12/08/17 08:23	12/11/17 14:38	PB104842

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
123-91-1	1,4-Dioxane	3.2	D	0.04	0.1	0.2	ug/L
SURROGATES							
7297-45-2	2-Methylnaphthalene-d10	0.33		30 - 150		83%	SPK: 0.4
93951-69-0	Fluoranthene-d10	0.31		30 - 150		77%	SPK: 0.4
4165-60-0	Nitrobenzene-d5	0.5	*	55 - 111		124%	SPK: 0.4
321-60-8	2-Fluorobiphenyl	0.59	*	53 - 106		147%	SPK: 0.4
1718-51-0	Terphenyl-d14	0.61	*	58 - 132		152%	SPK: 0.4
INTERNAL STANDARDS							
3855-82-1	1,4-Dichlorobenzene-d4	8503	8.48				
1146-65-2	Naphthalene-d8	17708	11.33				
15067-26-2	Acenaphthene-d10	9687	15.08				
1517-22-2	Phenanthrene-d10	24723	17.79				
1719-03-5	Chrysene-d12	26029	21.89				
1520-96-3	Perylene-d12	21365	24.57				

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

Report of Analysis

Client: Tetra Tech NUS, Inc. Date Collected: 12/04/17
 Project: CTO WE05 NWIRP Calverton, NY Date Received: 12/05/17
 Client Sample ID: FT-PZ-457S-20171204 SDG No.: I6740
 Lab Sample ID: I6740-13 Matrix: Water
 Analytical Method: SW8270SIM % Moisture: 100
 Sample Wt/Vol: 1000 Units: mL Final Vol: 1000 uL
 Soil Aliquot Vol: uL Test: SVOC-SIMGroup1
 Extraction Type : Decanted : N Level : LOW
 Injection Volume : GPC Factor : 1.0 GPC Cleanup : N PH :

File ID/Qc Batch:	Dilution:	Prep Date	Date Analyzed	Prep Batch ID
BE094967.D	1	12/08/17 08:23	12/09/17 02:12	PB104842

CAS Number	Parameter	Conc.	Qualifier	MDL	LOD	LOQ / CRQL	Units
TARGETS							
123-91-1	1,4-Dioxane	0.05	U	0.02	0.05	0.1	ug/L
SURROGATES							
7297-45-2	2-Methylnaphthalene-d10	0.37		30 - 150		92%	SPK: 0.4
93951-69-0	Fluoranthene-d10	0.37		30 - 150		92%	SPK: 0.4
4165-60-0	Nitrobenzene-d5	0.6	*	55 - 111		149%	SPK: 0.4
321-60-8	2-Fluorobiphenyl	0.57	*	53 - 106		143%	SPK: 0.4
1718-51-0	Terphenyl-d14	0.61	*	58 - 132		152%	SPK: 0.4
INTERNAL STANDARDS							
3855-82-1	1,4-Dichlorobenzene-d4	7966	8.48				
1146-65-2	Naphthalene-d8	17190	11.33				
15067-26-2	Acenaphthene-d10	9665	15.08				
1517-22-2	Phenantrhene-d10	23772	17.77				
1719-03-5	Chrysene-d12	24750	21.89				
1520-96-3	Perylene-d12	22194	24.56				

U = Not Detected

LOQ = Limit of Quantitation

MDL = Method Detection Limit

LOD = Limit of Detection

E = Value Exceeds Calibration Range

Q = indicates LCS control criteria did not meet requirements

M = MS/MSD acceptance criteria did not meet requirements

J = Estimated Value

B = Analyte Found in Associated Method Blank

N = Presumptive Evidence of a Compound

* = Values outside of QC limits

D = Dilution

() = Laboratory InHouse Limit

SUPPORT DOCUMENTATION
APPENDIX C

(

(

(

CLIENT INFORMATION		CLIENT PROJECT INFORMATION		CLIENT BILLING INFORMATION													
REPORT TO BE SENT TO:																	
COMPANY: <u>Tetra Tech</u>	ADDRESS: <u>5700 Lake Wright Dr. Suite 102</u>	PROJECT NAME: <u>NWIRP Calverton Site 2</u>	PROJECT NO.: <u>112G08005 WEOS</u>	BILL TO: <u>See Contract</u>	PO#:												
CITY: <u>Norfolk</u>	STATE: <u>VA ZIP: 23502</u>	LOCATION:	PROJECT MANAGER: <u>Kristi Francisco</u>	ADDRESS:													
ATTENTION: <u>Kristi Francisco</u>		e-mail: <u>Kristi.Francisco@tetratech.com</u>		CITY:	STATE: ZIP:												
PHONE: <u>757-466-4902</u>	FAX: <u></u>	PHONE: <u>757-466-4902</u>	FAX: <u></u>	ATTENTION:	PHONE:												
DATA TURNAROUND INFORMATION		DATA DELIVERABLE INFORMATION		ANALYSIS													
FAX: <u>Standard</u>	DAYS: <u></u>	<input type="checkbox"/> LEVEL 1: Results only	<input type="checkbox"/> Others: <u>See Contract</u>														
HARD COPY: <u>See Contract</u>	DAYS: <u></u>	<input type="checkbox"/> LEVEL 2: Results + QC	<input type="checkbox"/> See Contract														
EDD: <u></u>	DAYS: <u></u>	<input type="checkbox"/> LEVEL 3: Results (plus results raw data) + QC	<input type="checkbox"/>														
PREAPPROVED TAT: <input type="checkbox"/> YES <input type="checkbox"/> NO		<input type="checkbox"/> LEVEL 4: Results + QC (all raw data)	<input type="checkbox"/>														
* STANDARD TURNAROUND TIME IS 10 BUSINESS DAYS		<input type="checkbox"/> EDD Format: <u></u>	<input type="checkbox"/>														
CHEMTECH SAMPLE ID	PROJECT SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE COLLECTION		# OF BOTTLES	PRESERVATIVES									COMMENTS		
			COMP	GRAB		DATE	TIME	E	A	1	2	3	4	5	6	7	8
1.	FT-PZ-462S-20171202	GW	X	12-2-17 0850	1	X											
2.	FT-PZ-462I-20171202	GW	X	12-2-17 0852	1	X											
3.	FT-PZ-455S-20171202	GW	X	1036	1	X											
4.	FT-PZ-455I-20171202	GW	X	1045	1	X											
5.	FT-PZ-453S-20171202	GW	X	1226	1	X											
6.	FT-PZ-456I-20171204	GW	X	12-4-17 0850	4	1 3											
7.	FT-PZ-456I-FRB-20171204	QA	X	0850													LSD
8.	FT-PZ-456S-20171204	GW	X	12-4-17 0855	4	1 3											
9.	FT-PZ-461I-20171204	GW	X	12-4-17 1116	10	1 9											MS/MSD VOCs only
10.	FT-DUP06-20171204	GW	X	12-4-17 1200	4	1 3											Duplicate
SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION INCLUDING COURIER DELIVERY																	
RELINQUISHED BY SAMPLE:	DATE/TIME:	RECEIVED BY:	Conditions of bottles or coolers at receipt: <input type="checkbox"/> Compliant <input type="checkbox"/> Non Compliant												Cooler Temp. <u>21°C</u>		
1. <u>Jacob Birkett</u>	12-4-17 1600	1. FedEx	MeOH extraction requires an additional 4 oz jar for percent solid.												Ice in Cooler?: <u>yes</u>		
RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:	Comments:														
2.		2.															
RELINQUISHED BY:	DATE/TIME:	RECEIVED FOR LAB BY:	SHIPPED VIA: CLIENT: <input type="checkbox"/> HAND DELIVERED <input type="checkbox"/> OVERNIGHT												Shipment Complete:		
3.	12-5-17	3. <u>C. Ferro</u>	CHEMTECH: <input type="checkbox"/> PICKED UP <input type="checkbox"/> OVERNIGHT												<input type="checkbox"/> YES <input type="checkbox"/> NO		



Chemtech

284 Sneffield St
Mountainside, NJ 07042
(908) 789-8900

2 of 2

ID: LR - 537COC

I6740

7.1

CHAIN OF CUSTODY

Project ID: 112G08005-WE05

PO#:

Lauren Donston
Jake Birkett
Beau Benfield
(name)

For Laboratory Use Only

Work Order #: _____ Temp: _____ °C
Storage ID: _____ Storage Secured: Yes No

TAT: Standard: 21 days
(check one): HUR (Surcharge may apply)
 14 days 7 days Specify: _____

Invoice to: Name Company

Address

City

State Ph# Fax#

Tetra Tech

5700 Lake Wright Dr. Suite 102 Norfolk

VA

Relinquished by (printed name and signature)

Date

Time

Received by (printed name and signature)

Date Time

Jacob Birkett

12-4-17 1600

FedEx

Relinquished by (printed name and signature)

Date

Time

Received by (printed name and signature)

Date Time

Cheata

12-5-17 9:30

2:1^c

SHIP TO: Vista Analytical Laboratory
1104 Windfield Way
El Dorado Hills, CA 95762
(916) 673-1520 Fax (916) 673-0106

Method of Shipment:
FedEx

ATTN: _____

Tracking No.: _____

Add Analysis(es) Requested

Container(s)

~~1~~

EPA Method
537(DW only)

Quantity Type Matrix PFOA/PFOS UCMR3 PFAS List 6 537 List 14 Full List or 26 Other: Please List Below

~~1~~

1-4 Dioxane
VOCs

PFOA/PFOS UCMR3 PFAS List 6 PEAS List 14

Comments

FT-PZ4600I-20171204 12-4-17 1121 FT-PZ4600I 4 G/A GW 1 3 1-4 Dioxane preserved w/
ice.

FT-PZ457S-20171204 12-4-17 1354 FT-PZ457S 1 A GW 1 VOCs preserved w/ HCl

12/4/17

Special Instructions/Comments: _____

SEND
DOCUMENTATION
AND RESULTS TO:

Name: Kristi Francisco
Company: Tetra Tech
Address: 5700 Lake Wright Dr. Suite 102
City: Norfolk State: VA Zip: 23502
Phone: 757-466-4902 Fax: _____
Email: kristi.Francisco@tetratech.com

Container Types: P= HDPE, PJ= HDPE Jar

O = Other:

G = glass
J = glass amber

Bottle Preservation Type: T = Thiosulfate,

TZ = Trizma: _____

Matrix Types: AQ = Aqueous, DW = Drinking Water, EF = Effluent, PP = Pulp/Paper, SD = Sediment,

SL = Sludge, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other: _____

DATA PACKAGE

VOLATILE ORGANICS
SEMI-VOLATILE ORGANICS

PROJECT NAME : CTO WE05 NWIRP CALVERTON, NY

TETRA TECH NUS, INC.

661 Anderson Drive

Pittsburgh, Pennsylvania - 15220-2745

Phone No: 412-921-7090

ORDER ID : I6740

ATTENTION : Kristi Francisco



DoD ELAP

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Cover Page

Order ID : I6740

Project ID : CTO WE05 NWIRP Calverton, NY

Client : Tetra Tech NUS, Inc.

Lab Sample Number

I6740-01
I6740-02
I6740-03
I6740-04
I6740-05
I6740-06
I6740-07
I6740-08
I6740-09
I6740-10
I6740-11
I6740-12
I6740-13
I6740-14

Client Sample Number

FT-PZ-462S-20171202
FT-PZ-462I-20171202
FT-PZ-455S-20171202
FT-PZ-455I-20171202
FT-PZ-453S-20171202
FT-PZ-456I-20171204
FT-PZ-456S-20171204
FT-PZ-461I-20171204
I6740-08MS
I6740-08MSD
FT-DUP06-20171204
FT-PZ-460I-20171204
FT-PZ-457S-20171204
FT-TB02-20171204

I certify that the data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the laboratory manager or his designee, as verified by the following signature.

Signature :

APPROVED

Date: 12/19/2017
By Mildred V Reyes, QAQC Supervisor at 1:08 pm, Dec 19, 2017

NYDOH CERTIFICATION NO - 11376

NJDEP CERTIFICATION NO - 20012



284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

CASE NARRATIVE

Tetra Tech NUS, Inc.

Project Name: CTO WE05 NWIRP Calverton, NY

Project # N/A

Chemtech Project # I6740

Test Name: VOCMS Group1

A. Number of Samples and Date of Receipt:

1 Water sample was received on 12/05/2017.

13 Water samples were received on 12/05/2017.

B. Parameters

According to the Chain of Custody document, the following analyses were requested:

SVOC-SIMGroup1 and VOCMS Group1. This data package contains results for

VOCMS Group1.

C. Analytical Techniques:

The analysis performed on instrument MSVOA_N were done using GC column RXI-624SIL MS 30m 0.25mm 1.4 um. Cat#13868. The analysis of VOCMS Group1 was based on method 8260C.

D. QA/ QC Samples:

The Holding Times were met for all analysis.

The Surrogate recoveries met the acceptable criteria.

The Internal Standards Areas met the acceptable requirements.

The Retention Times were acceptable for all samples.

The MS recoveries met the requirements for all compounds .

The MSD recoveries met the acceptable requirements .

The RPD recoveries met criteria .

The Blank Spike met requirements for all samples .

The Blank Spike Duplicate met requirements for all samples .

The Blank analysis did not indicate the presence of lab contamination.

The %RSD is greater than 15% in the Initial Calibration (Method 82N0113017W.M) for Cyclohexane,1,1,2,2-Tetrachloroethane,1,2,4-Trichlorobenzene,Naphthalene,1,2,3-

Trichlorobenzene and Toluene-d8 compound is passing on linear regression.

The Continuous Calibration File ID VN045507.D met the requirements except for Cyclohexane .

The Tuning criteria met requirements.

E. Additional Comments:

The not QT review data is reported in the Miscellaneous.



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2

2.1

Please use %D calculated based on Avg RF and CCRF for all compounds using Average Response Factor when the %RSD value for a compound is <15% for the Initial Calibration curve and use %D calculated based on Amount added and Calculated amount for all compounds using Linear Regression when the %RSD value for a compound is > 15% for the Initial Calibration curve for SW-846 analysis.

F. Manual Integration Comments:

Please refer to the Manual integration Report included with the Run Logs for information on the manual integrations performed.

I certify that the data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. The laboratory manager or his designee, as verified by the following signature has authorized release of the data contained in this hard copy data package.

Signature Mildred V Reyes

APPROVED

By Mildred V Reyes, QAQC Supervisor at 1:07 pm, Dec 19, 2017

CASE NARRATIVE

Tetra Tech NUS, Inc.

Project Name: CTO WE05 NWIRP Calverton, NY

Project # N/A

Chemtech Project # I6740

Test Name: SVOC-SIMGroup1

A. Number of Samples and Date of Receipt:

1 Water sample was received on 12/05/2017.

13 Water samples were received on 12/05/2017.

B. Parameters

According to the Chain of Custody document, the following analyses were requested: SVOC-SIMGroup1 and VOCMS Group1. This data package contains results for SVOC-SIMGroup1.

C. Analytical Techniques:

The samples were analyzed on instrument BNA_E using GC Column ZB-SemiVolatiles Guardian which is 30 meters, 0.25 mm ID, 0.5 um df, Catalog # 7HG-G027-17-GGA. The analysis of SVOC-SIMGroup1 was based on method 8270-Modified and extraction was done based on method 3510.

D. QA/ QC Samples:

The Holding Times were met for all analysis.

The Surrogate recoveries met the acceptable criteria except for FT-PZ-462S-20171202 [2-Fluorophenol - 11%], FT-PZ-462I-20171202 [2,4,6-Tribromophenol - 133%, 2-Fluorobiphenyl - 136%, Nitrobenzene-d5 - 147%, Terphenyl-d14 - 160%], FT-PZ-455S-20171202 [2-Fluorobiphenyl - 142%, Nitrobenzene-d5 - 142%, Terphenyl-d14 - 172%], FT-PZ-455I-20171202 [2-Fluorobiphenyl - 154%, Nitrobenzene-d5 - 135%, Terphenyl-d14 - 166%], FT-PZ-453S-20171202 [2,4,6-Tribromophenol - 127%, 2-Fluorobiphenyl - 163%, Nitrobenzene-d5 - 153%, Terphenyl-d14 - 176%], FT-PZ-456I-20171204 [2-Fluorobiphenyl - 150%, Nitrobenzene-d5 - 142%, Terphenyl-d14 - 162%], FT-PZ-456S-20171204 [2,4,6-Tribromophenol - 213%, 2-Fluorobiphenyl - 340%, 2-Methylnaphthalene-d10 - 200%, Fluoranthene-d10 - 202%, Nitrobenzene-d5 - 303%, Terphenyl-d14 - 333%], FT-PZ-456S-20171204 [2-Fluorobiphenyl - 165%, Nitrobenzene-d5 - 145%, Terphenyl-d14 - 157%], FT-PZ-461I-20171204 [2,4,6-Tribromophenol - 136%, 2-Fluorobiphenyl - 155%, Nitrobenzene-d5 - 147%, Terphenyl-d14 - 162%], FT-DUP06-20171204 [2,4,6-Tribromophenol - 144%, 2-Fluorobiphenyl - 164%, Nitrobenzene-d5 - 148%, Terphenyl-d14 - 165%], FT-PZ-460I-20171204 [2,4,6-Tribromophenol - 143%, 2-Fluorobiphenyl - 167%, Nitrobenzene-d5 - 159%, Terphenyl-d14 - 198%], FT-PZ-460I-20171204DL [2,4,6-Tribromophenol - 129%, 2-Fluorobiphenyl - 147%, Nitrobenzene-d5 - 124%, Terphenyl-d14 - 152%], FT-PZ-457S-20171204 [2-Fluorobiphenyl - 143%, Nitrobenzene-d5 - 149%, Terphenyl-d14 - 152%], PB104842BS [Nitrobenzene-d5 - 122%] and PB104842BSD [Nitrobenzene-d5 -



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123%].but the failing surrogates are not affected to SVOC-SIM parameters list, therefore no corrective action was taken.

The Internal Standards Areas met the acceptable requirements except for FT-PZ-456S-20171204.but the failing internal Standards was not affected to SVOC-SIM parameters list, therefore no corrective action was taken .

The Retention Times were acceptable for all samples.

The RPD recoveries met criteria .

The Blank Spike met requirements for all samples .

The Blank Spike Duplicate met requirements for all samples .

The Blank analysis did not indicate the presence of lab contamination.

The %RSD is greater than 15% in the Initial Calibration (Method 8270-SIM-BE113017.M) for 2,4,6-Tribromophenol compound is passing on linear regression.

The Continuous Calibration File ID BE094964.D met the requirements except for 2,4,6-Tribromophenol and Nitrobenzene-d5 .The Continuous Calibration File ID BE094971.D met the requirements except for Nitrobenzene-d5 .

The Tuning criteria met requirements.

E. Additional Comments:

Sample FT-PZ-460I-20171204 was diluted due to high concentration.

The not QT review data is reported in the Miscellaneous.

Please use %D calculated based on Avg RF and CCRF for all compounds using Average Response Factor when the %RSD value for a compound is <15% for the Initial Calibration curve and use %D calculated based on Amount added and Calculated amount for all compounds using Linear Regression when the %RSD value for a compound is > 15% for the Initial Calibration curve for SW-846 analysis.

F. Manual Integration Comments:

Please refer to the Manual integration Report included with the Run Logs for information on the manual integrations performed.

I certify that the data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. The laboratory manager or his designee, as verified by the following signature has authorized release of the data contained in this hard copy data package.

Signature

APPROVED

By Mildred V Reyes, QAQC Supervisor at 1:07 pm, Dec 19, 2017

DATA REPORTING QUALIFIERS- ORGANIC

For reporting results, the following "Results Qualifiers" are used:

- Value** If the result is a value greater than or equal to the detection limit, report the value
- U** Indicates the compound was analyzed for but was not detected. Report the minimum detection limit for the sample with the U, i.e. "10 U". This is not necessarily the instrument detection limit attainable for this particular sample based on any concentration or dilution that may have been required.
- ND** Indicates the analyte was analyzed for, but not detected
- J** Indicates an estimated value. This flag is used:
(1) When estimating a concentration for a tentatively identified compound (library search hits, where a 1:1 response is assumed.)
(2) When the mass spectral data indicated the identification, however the result was less than the specified detection limit greater than zero. If the detection limit was 10ug/L and a concentration of 3 ug/L was calculated report as 3 J. This is flag is used when similar situation arise on any organic parameter i.e. Pest, PCB and others.
- B** Indicates the analyte was found in the blank as well as the sample report as "12 B".
- E** Indicates the analyte's concentration exceeds the calibrated range of the instrument for that specific analysis.
- D** This flag identifies all compounds identified in an analysis at a secondary dilution factor.
- P** This flag is used for Pesticide/PCB target analyte when there is >25% difference for detected concentrations between the two GC columns. The lower of the two values is reported on Form 1 and flagged with a "P".
- N** This flag indicates presumptive evidence of a compound. This is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It applies to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the flag is not used.
- A** This flag indicates that a Tentatively Identified Compound is a suspected aldol-condensation product.
- Q** Indicates the LCS did not meet the control limits requirements

APPENDIX A**QA REVIEW GENERAL DOCUMENTATION**

Project #: I6740

Completed**For thorough review, the report must have the following:****GENERAL:****Are all original paperwork present (chain of custody, record of communication, airbill, sample management lab chronicle, login page)****Check chain-of-custody for proper relinquish/return of samples****Is the chain of custody signed and complete****Check internal chain-of-custody for proper relinquish/return of samples /sample extracts****Collect information for each project id from server. Were all requirements followed****COVER PAGE:****Do numbers of samples correspond to the number of samples in the Chain of Custody on login page****Do lab numbers and client Ids on cover page agree with the Chain of Custody****CHAIN OF CUSTODY:****Do requested analyses on Chain of Custody agree with form I results****Do requested analyses on Chain of Custody agree with the log-in page****Were the correct method log-in for analysis according to the Analytical Request and Chain of Castody****Were the samples received within hold time****Were any problems found with the samples at arrival recorded in the Sample Management Laboratory****Chronicle****ANALYTICAL:****Was method requirement followed?****Was client requirement followed?****Does the case narrative summarize all QC failure?****All runlogs and manual integration are reviewed for requirements****All manual calculations and /or hand notations verified**1st Level QA Review Signature: DHVANI PATEL

Date: 12/19/2017

2nd Level QA Review Signature: Mildred V Reyes**APPROVED**Date:
By Mildred V Reyes, QAQC Supervisor at 1:07 pm, Dec 19, 2017

Hit Summary Sheet
SW-846

SDG No.: I6740
Client: Tetra Tech NUS, Inc.

B**C****D****E**

Sample ID	Client ID	Matrix	Parameter	Concentration	C	MDL	LOD	RDL	Units
Client ID: I6740-06	FT-PZ-456I-20171204 FT-PZ-456I-20171204	Water	Trichloroethene	0.50	J	0.28	0.5	5	ug/L
			Total Voc :	0.5					
			Total Concentration:	0.5					
Client ID: I6740-08	FT-PZ-461I-20171204 FT-PZ-461I-20171204	Water	1,1-Dichloroethene	0.82	J	0.47	0.5	5	ug/L
I6740-08	FT-PZ-461I-20171204	Water	1,1-Dichloroethane	0.96	J	0.36	0.5	5	ug/L
I6740-08	FT-PZ-461I-20171204	Water	cis-1,2-Dichloroethene	1.60	J	0.35	0.5	5	ug/L
I6740-08	FT-PZ-461I-20171204	Water	Trichloroethene	20.50		0.28	0.5	5	ug/L
I6740-08	FT-PZ-461I-20171204	Water	Tetrachloroethene	0.48	J	0.27	0.5	5	ug/L
			Total Voc :	24.36					
			Total Concentration:	24.36					
Client ID: I6740-11	FT-DUP06-20171204 FT-DUP06-20171204	Water	1,1-Dichloroethene	0.82	J	0.47	0.5	5	ug/L
I6740-11	FT-DUP06-20171204	Water	1,1-Dichloroethane	0.93	J	0.36	0.5	5	ug/L
I6740-11	FT-DUP06-20171204	Water	cis-1,2-Dichloroethene	1.60	J	0.35	0.5	5	ug/L
I6740-11	FT-DUP06-20171204	Water	Trichloroethene	20.60		0.28	0.5	5	ug/L
I6740-11	FT-DUP06-20171204	Water	Tetrachloroethene	0.47	J	0.27	0.5	5	ug/L
			Total Voc :	24.42					
			Total Concentration:	24.42					
Client ID: I6740-12	FT-PZ-460I-20171204 FT-PZ-460I-20171204	Water	1,1-Dichloroethene	60.40		0.47	0.5	5	ug/L
I6740-12	FT-PZ-460I-20171204	Water	1,1-Dichloroethane	23.20		0.36	0.5	5	ug/L
I6740-12	FT-PZ-460I-20171204	Water	cis-1,2-Dichloroethene	3.20	J	0.35	0.5	5	ug/L
I6740-12	FT-PZ-460I-20171204	Water	Trichloroethene	100.00		0.28	0.5	5	ug/L
I6740-12	FT-PZ-460I-20171204	Water	Tetrachloroethene	2.90	J	0.27	0.5	5	ug/L
			Total Voc :	189.7					
			Total Concentration:	189.7					

Surrogate SummarySDG No.: I6740Client: Tetra Tech NUS, Inc.Analytical Method: SW8260C

Lab Sample ID	Client ID	Parameter	Spike	Result	Recovery	Limits	
						Qual	Low
I6740-06	FT-PZ-456I-20171204	1,2-Dichloroethane-d4	50	53.42	107	81	118
		Dibromofluoromethane	50	48.43	97	80	119
		Toluene-d8	50	49.32	99	89	112
		4-Bromofluorobenzene	50	46.32	93	85	114
I6740-07	FT-PZ-456S-20171204	1,2-Dichloroethane-d4	50	54.87	110	81	118
		Dibromofluoromethane	50	49.22	98	80	119
		Toluene-d8	50	49.56	99	89	112
		4-Bromofluorobenzene	50	45.87	92	85	114
I6740-08	FT-PZ-461I-20171204	1,2-Dichloroethane-d4	50	52.97	106	81	118
		Dibromofluoromethane	50	49.29	99	80	119
		Toluene-d8	50	49.7	99	89	112
		4-Bromofluorobenzene	50	45.16	90	85	114
I6740-09MS	FT-PZ-461I-20171204MS	1,2-Dichloroethane-d4	50	53.11	106	81	118
		Dibromofluoromethane	50	49.78	100	80	119
		Toluene-d8	50	48.68	97	89	112
		4-Bromofluorobenzene	50	49.64	99	85	114
I6740-10MSD	FT-PZ-461I-20171204MSD	1,2-Dichloroethane-d4	50	52.5	105	81	118
		Dibromofluoromethane	50	50.29	101	80	119
		Toluene-d8	50	49	98	89	112
		4-Bromofluorobenzene	50	50.92	102	85	114
I6740-11	FT-DUP06-20171204	1,2-Dichloroethane-d4	50	51.18	102	81	118
		Dibromofluoromethane	50	49.34	99	80	119
		Toluene-d8	50	48.83	98	89	112
		4-Bromofluorobenzene	50	43.87	88	85	114
I6740-12	FT-PZ-460I-20171204	1,2-Dichloroethane-d4	50	52.94	106	81	118
		Dibromofluoromethane	50	49.42	99	80	119
		Toluene-d8	50	49.46	99	89	112
		4-Bromofluorobenzene	50	44.35	89	85	114
I6740-14	FT-TB02-20171204	1,2-Dichloroethane-d4	50	54.8	110	81	118
		Dibromofluoromethane	50	50.54	101	80	119
		Toluene-d8	50	49.71	99	89	112
		4-Bromofluorobenzene	50	42.99	86	85	114
VN1206WBL01	VN1206WBL01	1,2-Dichloroethane-d4	50	56.74	113	81	118
		Dibromofluoromethane	50	50.65	101	80	119
		Toluene-d8	50	50.53	101	89	112
		4-Bromofluorobenzene	50	44.58	89	85	114
VN1206WBS01	VN1206WBS01	1,2-Dichloroethane-d4	50	53.81	108	81	118
		Dibromofluoromethane	50	49.8	100	80	119
		Toluene-d8	50	50.36	101	89	112
		4-Bromofluorobenzene	50	51.11	102	85	114

**Matrix Spike/Matrix Spike Duplicate Summary
SW-846**

SDG No.: I6740

Client: Tetra Tech NUS, Inc.

Analytical Method: SW8260C

Parameter	Spike	Sample		Result	Units	Rec	RPD	Qual	Limits		RPD
		Result	Units			Rec			Low	High	
Lab Sample ID :	I6740-09MS	Client Sample ID :		FT-PZ-461I-20171204MS		Datafile :		VN045525.D			
Dichlorodifluoromethane	50	0	44.6	ug/L	89				32	152	
Chloromethane	50	0	42.4	ug/L	85				50	139	
Vinyl chloride	50	0	45.6	ug/L	91				58	137	
Bromomethane	50	0	29.9	ug/L	60				53	141	
Chloroethane	50	0	43	ug/L	86				60	138	
Trichlorofluoromethane	50	0	45.2	ug/L	90				65	141	
1,1,2-Trichlorotrifluoroethane	50	0	44.1	ug/L	88				70	136	
1,1-Dichloroethene	50	0.82	45.6	ug/L	90				71	131	
Acetone	250	0	180	ug/L	72				39	160	
Carbon disulfide	50	0	41.2	ug/L	82				64	133	
Methyl tert-butyl Ether	50	0	51.1	ug/L	102				71	124	
Methyl Acetate	50	0	53.3	ug/L	107				56	136	
Methylene Chloride	50	0	46.7	ug/L	93				74	124	
trans-1,2-Dichloroethene	50	0	44.9	ug/L	90				75	124	
1,1-Dichloroethane	50	0.96	47.3	ug/L	93				77	125	
Cyclohexane	50	0	44.5	ug/L	89				71	130	
2-Butanone	250	0	240	ug/L	96				56	143	
Carbon Tetrachloride	50	0	42.1	ug/L	84				72	136	
cis-1,2-Dichloroethene	50	1.6	48.1	ug/L	93				78	123	
Chloroform	50	0	46.7	ug/L	93				79	124	
1,1,1-Trichloroethane	50	0	45.1	ug/L	90				74	131	
Methylcyclohexane	50	0	44	ug/L	88				72	132	
Benzene	50	0	45.7	ug/L	91				79	120	
1,2-Dichloroethane	50	0	45.5	ug/L	91				73	128	
Trichloroethene	50	20.5	68.6	ug/L	96				79	123	
1,2-Dichloropropane	50	0	46.3	ug/L	93				78	122	
Bromodichloromethane	50	0	45.8	ug/L	92				79	125	
4-Methyl-2-Pentanone	250	0	260	ug/L	104				67	130	
Toluene	50	0	46.3	ug/L	93				80	121	
t-1,3-Dichloropropene	50	0	47.4	ug/L	95				73	127	
cis-1,3-Dichloropropene	50	0	46.2	ug/L	92				75	124	
1,1,2-Trichloroethane	50	0	46.5	ug/L	93				80	119	
2-Hexanone	250	0	250	ug/L	100				57	139	
Dibromochloromethane	50	0	46.8	ug/L	94				74	126	
1,2-Dibromoethane	50	0	48.3	ug/L	97				77	121	
Tetrachloroethene	50	0.48	43.4	ug/L	86				74	129	
Chlorobenzene	50	0	46.8	ug/L	94				82	118	
Ethyl Benzene	50	0	48.8	ug/L	98				79	121	
m/p-Xylenes	100	0	98.1	ug/L	98				80	121	
o-Xylene	50	0	50.1	ug/L	100				78	122	
Styrene	50	0	51.3	ug/L	103				78	123	
Bromoform	50	0	46.1	ug/L	92				66	130	
Isopropylbenzene	50	0	47.1	ug/L	94				72	131	
1,1,2,2-Tetrachloroethane	50	0	55.6	ug/L	111				71	121	
1,3-Dichlorobenzene	50	0	47.3	ug/L	95				80	119	
1,4-Dichlorobenzene	50	0	46.5	ug/L	93				79	118	
1,2-Dichlorobenzene	50	0	47.9	ug/L	96				80	119	

**Matrix Spike/Matrix Spike Duplicate Summary
SW-846**DG No.: I6740Client: Tetra Tech NUS, Inc.Analytical Method: SW8260C

Parameter	Spike	Sample			Rec Qual	RPD Qual	Limits		RPD
		Result	Result	Units			Low	High	
1,2-Dibromo-3-Chloropropane	50	0	54.5	ug/L	109		62	128	
1,2,4-Trichlorobenzene	50	0	42	ug/L	84		69	130	
Naphthalene	50	0	46.8	ug/L	94		61	128	
1,2,3-Trichlorobenzene	50	0	44	ug/L	88		69	129	

**Matrix Spike/Matrix Spike Duplicate Summary
SW-846**

SDG No.: I6740

Client: Tetra Tech NUS, Inc.

Analytical Method: SW8260C

Parameter	Spike	Sample			Rec Qual	RPD Qual	Limits			RPD
		Result	Units	Rec			Low	High		
Lab Sample ID :	I6740-10MSD	Client Sample ID :			FT-PZ-461I-20171204MSD			Datafile :	VN045526.D	
Dichlorodifluoromethane	50	0	45	ug/L	90	1	32	152	20	5
Chloromethane	50	0	42.7	ug/L	85	1	50	139	20	6
Vinyl chloride	50	0	46	ug/L	92	1	58	137	20	7
Bromomethane	50	0	34.5	ug/L	69	14	53	141	20	8
Chloroethane	50	0	44	ug/L	88	2	60	138	20	9
Trichlorofluoromethane	50	0	45.7	ug/L	91	1	65	141	20	10
1,1,2-Trichlorotrifluoroethane	50	0	44.6	ug/L	89	1	70	136	20	11
1,1-Dichloroethene	50	0.82	47.1	ug/L	93	3	71	131	20	12
Acetone	250	0	180	ug/L	72	0	39	160	20	13
Carbon disulfide	50	0	42.9	ug/L	86	4	64	133	20	14
Methyl tert-butyl Ether	50	0	52.4	ug/L	105	3	71	124	20	15
Methyl Acetate	50	0	54.7	ug/L	109	3	56	136	20	16
Methylene Chloride	50	0	46.6	ug/L	93	0	74	124	20	17
trans-1,2-Dichloroethene	50	0	45.8	ug/L	92	2	75	124	20	18
1,1-Dichloroethane	50	0.96	48.2	ug/L	94	1	77	125	20	19
Cyclohexane	50	0	44.8	ug/L	90	1	71	130	20	20
2-Butanone	250	0	240	ug/L	96	0	56	143	20	21
Carbon Tetrachloride	50	0	42.6	ug/L	85	1	72	136	20	22
cis-1,2-Dichloroethene	50	1.6	49.5	ug/L	96	3	78	123	20	23
Chloroform	50	0	47	ug/L	94	1	79	124	20	24
1,1,1-Trichloroethane	50	0	45.9	ug/L	92	2	74	131	20	25
Methylcyclohexane	50	0	45	ug/L	90	2	72	132	20	26
Benzene	50	0	46.7	ug/L	93	2	79	120	20	27
1,2-Dichloroethane	50	0	46.3	ug/L	93	2	73	128	20	28
Trichloroethene	50	20.5	71.6	ug/L	102	6	79	123	20	29
1,2-Dichloropropane	50	0	47	ug/L	94	2	78	122	20	30
Bromodichloromethane	50	0	47	ug/L	94	3	79	125	20	31
4-Methyl-2-Pentanone	250	0	270	ug/L	108	4	67	130	20	32
Toluene	50	0	46.9	ug/L	94	1	80	121	20	33
t-1,3-Dichloropropene	50	0	48.5	ug/L	97	2	73	127	20	34
cis-1,3-Dichloropropene	50	0	47.1	ug/L	94	2	75	124	20	35
1,1,2-Trichloroethane	50	0	47.2	ug/L	94	1	80	119	20	36
2-Hexanone	250	0	260	ug/L	104	4	57	139	20	37
Dibromochloromethane	50	0	46.5	ug/L	93	1	74	126	20	38
1,2-Dibromoethane	50	0	49.2	ug/L	98	2	77	121	20	39
Tetrachloroethene	50	0.48	42.9	ug/L	85	1	74	129	20	40
Chlorobenzene	50	0	46.3	ug/L	93	1	82	118	20	41
Ethyl Benzene	50	0	48.4	ug/L	97	1	79	121	20	42
m/p-Xylenes	100	0	97.5	ug/L	98	1	80	121	20	43
o-Xylene	50	0	49.5	ug/L	99	1	78	122	20	44
Styrene	50	0	51.2	ug/L	102	0	78	123	20	45
Bromoform	50	0	46.9	ug/L	94	2	66	130	20	46
Isopropylbenzene	50	0	47.1	ug/L	94	0	72	131	20	47
1,1,2,2-Tetrachloroethane	50	0	56	ug/L	112	1	71	121	20	48
1,3-Dichlorobenzene	50	0	47	ug/L	94	1	80	119	20	49
1,4-Dichlorobenzene	50	0	47.1	ug/L	94	1	79	118	20	50
1,2-Dichlorobenzene	50	0	48.1	ug/L	96	0	80	119	20	51

**Matrix Spike/Matrix Spike Duplicate Summary
SW-846**DG No.: I6740Client: Tetra Tech NUS, Inc.Analytical Method: SW8260C

Parameter	Spike	Sample			Rec		RPD Qual	Limits		RPD
		Result	Units	Rec	Qual	Low	High			
1,2-Dibromo-3-Chloropropane	50	0	ug/L	109	0	62	128	20	5	
1,2,4-Trichlorobenzene	50	0	ug/L	87	4	69	130	20	6	
Naphthalene	50	0	ug/L	101	8	61	128	20	7	
1,2,3-Trichlorobenzene	50	0	ug/L	93	5	69	129	20	8	

**Laboratory Control Sample/Laboratory Control Sample Duplicate Summary
SW-846**

SDG No.: I6740

Client: Tetra Tech NUS, Inc.

Analytical Method: SW8260C

Datafile : VN045509.D

Lab Sample ID	Parameter	Spike	Result	Unit	Rec	RPD	Qual	Limits		RPD
								Low	High	
VN1206WBS01	Dichlorodifluoromethane	20	20.3	ug/L	102			32	152	
	Chloromethane	20	20.4	ug/L	102			50	139	
	Vinyl chloride	20	20.5	ug/L	103			58	137	
	Bromomethane	20	19.9	ug/L	100			53	141	
	Chloroethane	20	20.3	ug/L	102			60	138	
	Trichlorodifluoromethane	20	20.1	ug/L	101			65	141	
	1,1,2-Trichlorotrifluoroethane	20	20.2	ug/L	101			70	136	9
	1,1-Dichloroethene	20	19.4	ug/L	97			71	131	
	Acetone	100	100	ug/L	100			39	160	
	Carbon disulfide	20	18.3	ug/L	92			64	133	11
	Methyl tert-butyl Ether	20	20.7	ug/L	104			71	124	
	Methyl Acetate	20	23.3	ug/L	117			56	136	
	Methylene Chloride	20	19.6	ug/L	98			74	124	
	trans-1,2-Dichloroethene	20	19.1	ug/L	96			75	124	
	1,1-Dichloroethane	20	20.4	ug/L	102			77	125	
	Cyclohexane	20	19.3	ug/L	97			71	130	
	2-Butanone	100	100	ug/L	100			56	143	15
	Carbon Tetrachloride	20	18.6	ug/L	93			72	136	
	cis-1,2-Dichloroethene	20	19.8	ug/L	99			78	123	16
	Chloroform	20	20.3	ug/L	102			79	124	
	1,1,1-Trichloroethane	20	19.9	ug/L	100			74	131	
	Methylcyclohexane	20	19	ug/L	95			72	132	
	Benzene	20	19.8	ug/L	99			79	120	
	1,2-Dichloroethane	20	20	ug/L	100			73	128	
	Trichloroethene	20	18.2	ug/L	91			79	123	
	1,2-Dichloropropane	20	20.2	ug/L	101			78	122	
	Bromodichloromethane	20	19.9	ug/L	100			79	125	
	4-Methyl-2-Pentanone	100	110	ug/L	110			67	130	
	Toluene	20	20.1	ug/L	101			80	121	
	t-1,3-Dichloropropene	20	20	ug/L	100			73	127	
	cis-1,3-Dichloropropene	20	19.9	ug/L	100			75	124	
	1,1,2-Trichloroethane	20	20.1	ug/L	101			80	119	
	2-Hexanone	100	110	ug/L	110			57	139	
	Dibromochloromethane	20	19.4	ug/L	97			74	126	
	1,2-Dibromoethane	20	19.9	ug/L	100			77	121	
	Tetrachloroethene	20	19.1	ug/L	96			74	129	
	Chlorobenzene	20	19.5	ug/L	98			82	118	
	Ethyl Benzene	20	19.5	ug/L	98			79	121	
	m/p-Xylenes	40	40.3	ug/L	101			80	121	
	o-Xylene	20	20	ug/L	100			78	122	
	Styrene	20	20.3	ug/L	102			78	123	
	Bromoform	20	18.7	ug/L	94			66	130	
	Isopropylbenzene	20	20.1	ug/L	101			72	131	
	1,1,2,2-Tetrachloroethane	20	21.9	ug/L	110			71	121	
	1,3-Dichlorobenzene	20	19.8	ug/L	99			80	119	
	1,4-Dichlorobenzene	20	19.3	ug/L	97			79	118	
	1,2-Dichlorobenzene	20	19.7	ug/L	99			80	119	
	1,2-Dibromo-3-Chloropropane	20	21.8	ug/L	109			62	128	
	1,2,4-Trichlorobenzene	20	15.8	ug/L	79			69	130	

**Laboratory Control Sample/Laboratory Control Sample Duplicate Summary
SW-846**SDG No.: I6740Client: Tetra Tech NUS, Inc.Analytical Method: SW8260C

Datafile : VN045509.D

Lab Sample ID	Parameter	Spike	Result	Unit	Rec	RPD	Qual	Limits		RPD
								Low	High	
VN1206WBS01	Naphthalene	20	15.2	ug/L	76			61	128	
	1,2,3-Trichlorobenzene	20	16.4	ug/L	82			69	129	



284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

VOLATILE METHOD BLANK SUMMARY

EPA SAMPLE NO.

VN1206WBL01

Lab Name: CHEMTECH

Contract: TETR06

Lab Code: CHEM Case No.: I6740

SAS No.: I6740 SDG NO.: I6740

Lab File ID: VN045508.D

Lab Sample ID: VN1206WBL01

Date Analyzed: 12/06/2017

Time Analyzed: 10:41

GC Column: RXI-624 ID: 0.25 (mm)

Heated Purge: (Y/N) N

Instrument ID: MSVOA_N

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
VN1206WBS01	VN1206WBS01	VN045509.D	12/06/2017
FT-TB02-20171204	I6740-14	VN045515.D	12/06/2017
FT-PZ-456I-20171204	I6740-06	VN045518.D	12/06/2017
FT-PZ-456S-20171204	I6740-07	VN045519.D	12/06/2017
FT-PZ-461I-20171204	I6740-08	VN045520.D	12/06/2017
FT-DUP06-20171204	I6740-11	VN045521.D	12/06/2017
FT-PZ-460I-20171204	I6740-12	VN045522.D	12/06/2017
FT-PZ-461I-20171204MS	I6740-09MS	VN045525.D	12/06/2017
FT-PZ-461I-20171204MSD	I6740-10MSD	VN045526.D	12/06/2017

COMMENTS:



284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name:	CHEMTECH	Contract:	TETR06
Lab Code:	CHEM	Case No.:	I6740
Lab File ID:	VN045364.D	BFB Injection Date:	11/30/2017
Instrument ID:	MSVOA_N	BFB Injection Time:	10:15
GC Column:	RXI-624 ID: 0.25 (mm)	Heated Purge: Y/N	N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	19.3
75	30.0 - 60.0% of mass 95	49.7
95	Base Peak, 100% relative abundance	100
96	5.0 - 9.0% of mass 95	6.3
173	Less than 2.0% of mass 174	0.7 (0.9) 1
174	50.0 - 100.0% of mass 95	81.6
175	5.0 - 9.0% of mass 174	6 (7.4) 1
176	95.0 - 101.0% of mass 174	79.3 (97.2) 1
177	5.0 - 9.0% of mass 176	5.1 (6.5) 2

1-Value is % mass 174

2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
VSTDICC001	VSTDICC001	VN045365.D	11/30/2017	10:51
VSTDICC005	VSTDICC005	VN045366.D	11/30/2017	11:29
VSTDICC020	VSTDICC020	VN045367.D	11/30/2017	11:57
VSTDICCC050	VSTDICCC050	VN045368.D	11/30/2017	12:22
VSTDICC100	VSTDICC100	VN045369.D	11/30/2017	12:47
VSTDICC150	VSTDICC150	VN045370.D	11/30/2017	13:13



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VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: CHEMTECHContract: TETR06Lab Code: CHEM Case No.: I6698SAS No.: I6698 SDG No.: I6698Instrument ID: MSVOA_NCalibration Date(s): 11/30/2017 11/30/2017Heated Purge: (Y/N) NCalibration Time(s): 10:51 13:13GC Column: RXI-624 ID: 0.25 (mm)

LAB FILE ID:	RRF001 = VN045365.D	RRF005 = VN045366.D	RRF020 = VN045367.D					
COMPOUND	RRF001	RRF005	RRF020	RRF050	RRF100	RRF150	RRF	% RSD
Dichlorodifluoromethane	0.460	0.458	0.499	0.514	0.507	0.478	0.486	5
Chloromethane	0.778	0.606	0.648	0.665	0.664	0.619	0.663	9.2
Vinyl Chloride	0.677	0.586	0.620	0.648	0.646	0.595	0.629	5.5
Bromomethane	0.450	0.322	0.331	0.347	0.352	0.347	0.358	12.9
Chloroethane	0.445	0.365	0.357	0.383	0.382	0.349	0.380	9
Trichlorofluoromethane	0.913	0.803	0.799	0.822	0.811	0.766	0.819	6.1
1,1,2-Trichlorotrifluoroethane	0.660	0.543	0.518	0.521	0.518	0.488	0.541	11.2
1,1-Dichloroethene	0.546	0.449	0.458	0.482	0.485	0.462	0.480	7.3
Acetone	0.252	0.178	0.190	0.206	0.209	0.184	0.203	13.2
Carbon Disulfide	1.351	1.147	1.305	1.389	1.429	1.344	1.328	7.4
Methyl tert-butyl Ether	1.461	1.267	1.354	1.509	1.547	1.450	1.431	7.2
Methyl Acetate	0.566	0.440	0.495	0.540	0.550	0.496	0.515	9
Methylene Chloride	0.665	0.591	0.561	0.583	0.575	0.537	0.586	7.4
trans-1,2-Dichloroethene	0.582	0.471	0.489	0.514	0.515	0.486	0.510	7.7
1,1-Dichloroethane	1.302	1.099	1.032	1.082	1.088	1.008	1.102	9.5
Cyclohexane	1.907	0.987	0.936	0.985	1.023	0.938	1.129	33.9
2-Butanone	0.258	0.217	0.231	0.259	0.269	0.242	0.246	7.9
Carbon Tetrachloride	0.567	0.420	0.446	0.448	0.450	0.436	0.461	11.5
cis-1,2-Dichloroethene	0.670	0.571	0.563	0.592	0.597	0.572	0.594	6.6
Chloroform	1.235	1.017	0.970	1.015	1.001	0.937	1.029	10.2
1,1,1-Trichloroethane	1.018	0.818	0.802	0.830	0.837	0.795	0.850	9.9
Methylcyclohexane	0.546	0.478	0.568	0.565	0.606	0.577	0.557	7.8
Benzene	1.560	1.390	1.448	1.479	1.499	1.403	1.463	4.4
1,2-Dichloroethane	0.566	0.471	0.480	0.472	0.489	0.446	0.487	8.4
Trichloroethene	0.373	0.336	0.344	0.341	0.350	0.338	0.347	4
1,2-Dichloropropane	0.468	0.397	0.411	0.409	0.424	0.387	0.416	6.8
Bromodichloromethane	0.502	0.452	0.472	0.476	0.490	0.464	0.476	3.8
4-Methyl-2-Pentanone	0.291	0.262	0.302	0.328	0.340	0.307	0.305	9.1
Toluene	0.798	0.792	0.867	0.867	0.890	0.836	0.842	4.7
t-1,3-Dichloropropene	0.426	0.433	0.484	0.511	0.552	0.529	0.489	10.5
cis-1,3-Dichloropropene	0.538	0.500	0.566	0.594	0.626	0.591	0.569	7.9
1,1,2-Trichloroethane	0.368	0.324	0.327	0.324	0.329	0.309	0.330	6
2-Hexanone	0.169	0.166	0.200	0.222	0.235	0.212	0.201	14

* Compounds with required minimum RRF and maximum %RSD values.

All other compounds must meet a minimum RRF of 0.010.

RRF of 1,4-Dioxane = Value should be divide by 1000.



VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: CHEMTECH

Contract: TETR06

Lab Code: CHEM Case No.: I6698

SAS No.: I6698 SDG No.: I6698

Instrument ID: MSVOA_N

Calibration Date(s): 11/30/2017 11/30/2017

Heated Purge: (Y/N) N

Calibration Time(s): 10:51 13:13

GC Column: RXI-624 ID: 0.25 (mm)

LAB FILE ID:	RRF001 = VN045365.D	RRF005 = VN045366.D	RRF020 = VN045367.D					
COMPOUND	RRF001	RRF005	RRF020	RRF050	RRF100	RRF150	RRF	% RSD
Dibromochloromethane	0.317	0.305	0.329	0.333	0.348	0.339	0.328	4.6
1,2-Dibromoethane	0.289	0.288	0.303	0.304	0.311	0.301	0.299	3
Tetrachloroethene	0.406	0.372	0.356	0.337	0.328	0.317	0.353	9.2
Chlorobenzene	1.123	1.017	1.020	1.022	1.032	1.004	1.037	4.2
Ethyl Benzene	1.751	1.679	1.749	1.818	1.879	1.796	1.779	3.9
m/p-Xylenes	0.593	0.597	0.668	0.686	0.704	0.680	0.655	7.3
o-Xylene	0.552	0.573	0.633	0.663	0.685	0.659	0.628	8.5
Styrene	0.759	0.858	1.017	1.065	1.116	1.087	0.984	14.5
Bromoform	0.247	0.228	0.238	0.249	0.251	0.253	0.244	3.9
Isopropylbenzene	4.928	4.377	4.050	3.925	3.874	3.625	4.130	11.2
1,1,2,2-Tetrachloroethane	1.782	1.300	1.076	1.036	0.991	0.908	1.182	27.2
1,3-Dichlorobenzene	1.844	1.640	1.623	1.609	1.627	1.581	1.654	5.8
1,4-Dichlorobenzene	1.785	1.618	1.579	1.561	1.603	1.560	1.618	5.3
1,2-Dichlorobenzene	1.862	1.652	1.639	1.627	1.598	1.523	1.650	6.9
1,2-Dibromo-3-Chloropropane	0.119	0.148	0.144	0.154	0.153	0.143	0.144	8.9
1,2,4-Trichlorobenzene	0.327	0.337	0.560	0.745	0.853	0.916	0.623	41
Naphthalene	0.814	0.684	0.841	1.357	1.725	1.883	1.217	42
1,2,3-Trichlorobenzene	0.398	0.373	0.600	0.760	0.849	0.889	0.645	34.8
1,2-Dichloroethane-d4	0.703	0.530	0.638	0.641	0.644	0.600	0.626	9.2
Dibromofluoromethane	0.367	0.291	0.344	0.331	0.329	0.318	0.330	7.7
Toluene-d8	1.003	0.880	1.344	1.283	1.304	1.255	1.178	16.1
4-Bromofluorobenzene	0.382	0.312	0.417	0.420	0.450	0.445	0.404	12.7

* Compounds with required minimum RRF and maximum %RSD values.

All other compounds must meet a minimum RRF of 0.010.

RRF of 1,4-Dioxane = Value should be divide by 1000.